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Food and Nutrition Bulletin
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Food Chemistry

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Food Hydrocolloids
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Food Trade Review
Fruits

Getreide-Mehl und Brot (German)
Gordian

Hortscience

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Indian Baker
Indian Cashew Journal
Indian Coconut Journal
Indian Coffee
Indian Dairyman
Indian Farming
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Insect Science and Its Application
International Bottler and Packer
International Fruit World
International Journal of Food Microbiology
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International Journal of Food Technology
International Journal for Vitamin and Nutrition Research
International Pest Control
International Sugar Journal
Invention Intelligence
Irish Journal of Food Science and Technology
ISI Bulletin
Israel Journal of Technology

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JARQ (Japan Agricultural Research Quarterly)
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Journal of Agricultural Engineering Research
Journal of Animal Science
Journal of Bioscience
Journal of Cereal Science
Journal of Chemical Technology and Biotechnology
Journal of Coffee Research
Journal of Dairy Research
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Journal of Plant Foods
Journal of Quality Technology
Journal of Root Crops
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Journal of Stored Products Research
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Journal of the American Oil Chemist's Society
Journal of the American Society for Horticultural Science
Journal of the Association of Official Analytical Chemists
Journal of the Association of Public Analyst
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Journal of the Indian Institute of Science
Journal of the Institute of Brewing
Journal of the Institution of Chemist's (India)
Journal of the Japanese Society for Food Science and Technology (Japanese) (Nippon Shokuhin Kogyo Gakkaishi)
Journal of the Japanese Society of Starch Science (Japanese)
Journal of the National Science Council of Sri Lanka
Journal of the Oil Technologists Association of India
Journal of the Science of Food and Agriculture
Journal of the Society of Dairy Technology

Kenya Coffee
Khadigramodyog

Lebensmittelindustrie (German)

Madras Agricultural Journal
Manufacturing Confectioner
Meat Science
Memoirs of Faculty of Fisheries Kagoshima University
Milling Feed and Fertiliser
Milling & Baking News
Mushroom Information
Mushroom Journal
Mysore Journal of Agricultural Sciences

Nahrung (German)
Nature
Netherlands Milk and Dairy Journal
New Scientist
New York's Food and Life Sciences
New Zealand Journal of Dairy Science and Technology
Nutrition Reports International
Nutrition Reviews

Oils and Oilseeds Journal
Oleagineux (French)

Packaging
Packaging India
Packaging Japan
Packaging Review, U.K.
Packaging Week
PAG Bulletin
Pakistan Journal of Science
Pakistan Journal of Scientific and Industrial Research
Pans
Paperboard Packaging
Peanut Journal of Nut World
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Pesticide Science
Phillippine Journal of Food Science Technology
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Plant Cell Reports
Plant Physiology

Plant Science
Poultry Guide
Poultry Science
Poultry Tribune
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Profodcil Bulletin
Progress in Food and Nutrition Science
Progressive Horticulture
Punjab Horticultural Journal

Qualitas Plantarum
Quick Frozen Foods
Quick Frozen Foods International

Report of the National Food Research Institute (Japan)
Research and Industry
Revista de Agroquimica Y Technologia de Alimentos (Spanish)
Rice Journal
Riechstoffe Aromen Kosmetica (German)

Science (USA)
Science and Culture
Science Reporter
Sciences
Sciences Des Aliments (French/English)
Scientific American
Scientific World
Seafood Export Journal
Seeds and Farms
Seed Science and Technology
Solar Energy
Soy bean Digest
Starch/Starke (German)
Swedish Journal of Agricultural Research

Tea and Coffee Trade Journal
Technical Quarterly
Technology Review
Toxicology
Tropical Agriculture
Tropical Grain Legume Bulletin
Tropical Pest Management

Tropical Stored Products Information
Two and a bud

VarFoda (Swedish)
Voeding (English/French/German)

World Coffee and Tea
World Crops
World Health
World's Poultry Science Journal

Zeitschrift Fuer Lebensmittel-Untersch und Forschung (German)

CONTENTS

		Page No
01.	General ...	1
02.	Food Processing ...	2
03.	Food Packaging ...	3
04.	Food Engineering and Equipment ...	3
05.	Energy in Food Processing ...	–
06.	Food Chemistry and Analysis ...	4
07.	Food Microbiology and Hygiene ...	6
08.	Biotechnology ...	11
09.	Tissue Culture ...	–
10.	Food Additives ...	–
11.	Cereals ...	11
12.	Millets ...	19
13.	Pulses ...	21
14.	Oilseeds and Nuts ...	24
15.	Tubers and Vegetables ...	29
16.	Fruits ...	33
17.	Confectionery, Starch and Sugar ...	37
18.	Bakery Products ...	39
19.	Milk and Dairy Products ...	42
20.	Meat and Poultry ...	51
21.	Seafoods ...	57
22.	Protein Foods ...	59
23.	Alcoholic and Non-alcoholic Beverages ...	60
24.	Fats and Oils ...	64
25.	Spices and Condiments ...	68
26.	Sensory Evaluation ...	70
27.	Food Storage ...	–
28.	Infestation Control and Pesticides ...	70
29.	Biochemistry and Nutrition ...	70
30.	Toxicology ...	72
31.	Food Laws and Regulations ...	73

Index

ABBREVIATIONS

A	ampere
AAS	atomic absorption spectrometry
abstr.	abstract
ad lib.	ad libitum
ADP	adenosine diphosphate
Anon.	Anonymous
AOAC	Association of Official Analytical Chemists
approx.	approximately
atm	atmosphere
ATP	adenosine triphosphate
a_w	water activity
BHA	butylated hydroxyanisole
BHT	butylated hydroxytoluene
BOD	biological oxygen demand
b.p.	boiling point
Btu	British thermal unit
c-	centi- [as in cm, cm^2, cm^3]
cal	calorie
cd	candela
Ci	curie
CMC	carboxymethyl cellulose
COD	chemical oxygen demand
coeff.	coefficient
conc.	concentrated
concn.	concentration
cv.	cultivar
cwt	hundredweight
d-	deci-
DE	dextrose equivalent
detn.	determination
DFD	dark firm dry
diam.	diameter
dil.	dilute
DM	dry matter, Deutsche Mark
DNA	deoxyribonucleic acid(s)
dyn	dyne
E.	East, Eastern, etc.
ECD.	electron capture detection
EDTA	ethylenediaminetetraacetic acid
Eh	oxidation-reduction potential
ELISA	enzyme-linked immunosorbent assay
f-	femto- [10^{-15}; as in fCi]
°F	degree Fahrenheit
FAO	Food and Agricultural Organization
FDA	Food and Drug Administration
FID	flame ionization detection
fl oz	fluid ounce
f.p.	freezing point
ft	foot, feet
g	gram
GC	gas chromatography
gn	gravity
gal	gallon
gf	gram-force
GLC	gas-liquid chromatography
h	hour
ha	hectare
HDPE	high density polyethylene
hl	hectolitre [100 l]
hp	horse power
HPLC	high performance/pressure liquid chromatography
HTST	high temperature short time
Hz	hertz [frequency cycles/s]
in	inch
IR	infrared
IU	international unit
J	joule
k-	kilo- [as in kcal, kg]
K	Kelvin
l	litre
lb	pound
lbf	pound-force
LDPE	low density polyethylene
m-	milli- [as in mg, ml, mm]
m-equiv	milli-equivalent
m	molar concentration
M-	mega- [as in Mrad]
max.	maximum
min	minute [time]
min.	minimum
mol	mole
mol.wt.	molecular weight
m.p.	melting point
MPN	most probable number
MS	mass-spectrometry
n-	nano-[10^{-9}, as in nm]
N	Newton [kg m/s^2]
N.	North, Northern, normal concentration
NMR	nuclear magnetic resonance
NPU	net protein utilization
oz	ounce
p-	pico- [10^{-12}, as in pCi]
P	poise
P	probability
Pa	Pascal [N/m^2]
PAGE	polyacrylamide gel electrophoresis
PER	protein efficiency ratio
p.p.b.	parts per billion
p.p.m.	parts per million
PSE	pale soft exudative
PTFE	polytetrafluorethylene
PVC	polyvinyl chloride
PVDC	polyvinylidene chloride
qt	quart
R	rontgen
rad	rad or radian
ref.	reference(s)
rev/min	revolutions per minute
RH	relative humidity
RNA	ribonucleic acid(s)
S.	South, Southern, etc.
s.d.	standard deviation
SDS	sodium dedecylsulphate
s.e.	standard error
s	second [time]
SNF	solids-not-fat
sp., spp.	species
sp.gr.	specific gravity
summ.	summary
Suppl.	Supplement
t	metric tonne
temp.	temperature
TLC	thin layer chromatography
TS	total solids
UHT	ultra-high temperature
UV	ultraviolet
V	volt
var.	variety
vol.	volume
v/v	volume/volume
W	watt
W.	West, Western, etc.
WHO	World Health Organization
w/v	weight/volume
wk	week
wt.	weight
yd	yard
yr	year
µ	micro-[as in g, m]
%	per centum
>	greater than
≥	greater than or equal to; not less than
<	less than
≤	less than or equal to; not greater than

Chemical symbols are used for all elements.

ABBREVIATIONS FOR LANGUAGES

Language of text	
Dutch	Nl
French	Fr
German	De
Italian	It
Japanese	Ja
Norwegian	No
Spanish	Es
Swedish	Sv

§§§§

GENERAL

1 Bolaffi (A) and Lulay (D). The food service industry. Continuing into the future with an old friend. Food Technology 43(9); 1989; 258-260, 262-266

Article covers structure and scope of food service, food technology in food service, meeting the push-pull dynamics of the market place, and future needs. 2 references. SRA

2 Bressani (R). Food science and technology in developing countries during the past 50 years. Food Technology 43(9); 1989; 108-114, 119-132

3 Clydesdale (FM). Present and future of food science and technology in industrialized countries. Food Technology 43(9); 1989; 134-146

4 Figneiredo (AA). Food production and the food industry in Brazil. Their impact on nutritional status. Food Reviews International 5(2); 1989; 237-250

Review. 19 references. SRA

5 Goldblith (SA). 50 years of progress in food science and technology. From art based on experience to technology based on science. Food Technology 43(9); 1989; 88-102, 104, 107, 28

6 Gorgatti-Netto (A). Present and future of food science and technology in developing countries. Food Technology 43(9); 1989; 148-152, 154-168

This articles although focusses present and future of food science and technology of Latin America most of the concepts discussed are applicable to all developing countries. Aspects covered are food and people, food production and technology, food losses and energy waste, education and malnutrition, food research and food availability and future perspectives. 23 references. SRA

7 Haenel (H). Fast foods. Ernahrungsforschung 33(2); 1988; 32-34 (De).

Fast foods (FF) are small, quickly prepared and served and mostly hot meals produced on an industrial scale. FF serve in an increasing degree not only as snacks but also an main meals. They are the results of changes in nutrition behaviour; they are an alternative to conventional catering or to eating at home or in the canteen. In the beginning, the FF-conception with its uniformity and very small var. was oriented towards children and adolescents. Today within the FF-conception variants aimed at a wider range of target-groups, or the application of new operation system gain in impor-

tance. Taking into account increased health consciouness the small easily digestible "meal" which is rich in vitamins and helps to control body wt. is considered to be equivalent to traditional dishes. AS

8 Jasol (FSKR). Export prospects of horticultural produce from India. Indian Horticulture 33(4)-34(1); 1989; 79-81, 83, 85

An exhaustive coverage on export of horticultural products from India including the cities from where export is being done; the important commodities exported from each city, season in which the export is done, packaging of commodities, cost and price of export; cargo space and cargo timing; the constraints faced by exporters at Bombay and Trivandrum despatch centres, and the future prospects and the government policy on export of horticultural products. KAR

9 McKay (G), Raymond Murphy (W) and Jodieri-Dabbaghzadeh (S). Settling and fluidisation characteristics of carrot particles in water. Israel Journal of Technology 13(1); 1989; 51-69

The fluidisation and settling characteristics of cylindrical particles have been studied. Relationships have been established using carrots and plastic cylinders, namely PVC and nylon 6:6. Logarithmic plots of fluid velocity versus voidage enabled the min. transportation (terminal) velocity for carrot particles to be determined. Such data are of use to carrot processing plants. At the terminal velocity a resistance coeff. C_L, has been determined and correlated against the sphericity factor, $Phis_S$, by the equation: $\log C_L = 0.77 + 4.75 \log/Phi_S$. In the fluidisation studies a modified Ergum equation was derived relating the friction factor, f_v, to the Reynolds number, RE_{de} and voidage, $\log f_v = 1.44 + 0.53 \log RE/(1-Epsilon)$ settling velocities were determined for the three materials and for different aspect ratios. AS

10 Reineccius (GA). Flavour encapsulation. Food Reviews International 5(2); 1989; 147-176

This review provides a brief description of the flavour encapsulation processes most common or commercially promising in the industry. The discussion covers spray drying, extrusion, molecular inclusion via cyclodextrins, coacervation, fat encapsulation and miscellaneous, processes. 74 references. SRA

FOOD PROCESSING

11 Lund (D). Food processing. From art to engineering. Food Technology 43(9); 1989; 242-244, 246-247

This article highlights some of the food processing advances that will drive this revolution for the food industry. 50 yrs of processing advances, driving forces for new technology, the need for basic knowledge, requirements for advances in food manufacturing

(automation, unit operations), and threshold of a revolution are covered. 10 references. SRA

FOOD PACKAGING

12 Dowens (TW). Food packaging in the IFT era. Five decades of unprecedented growth and change. Food Technology 43(9); 1989; 228-240

This article reviews packaging from historical view point, major catagories of packaging materials, and examine how packages and packaging have changes during the 50 yrs of existance of the Institute of Food Technologists. Also covered business and marketing strategies, revolution and the environment, education and professional developments. 13 references. SRA

13 Laad (UD). Open top sanitary can - a versatile container. Indian Food Packer 43(6); 1989; 29-32

The advantage cf open top sanitary (OTS) cans, its manufacturing process, and superior packaging properties are described in this general article. VKR

FOOD ENGINEERING AND EQUIPMENT

14 Chase (D). The smart network. Food 11(6); 1989; 33-37

The usage of automation techniques in food industry is discussed. The effect of computers on food industry in coming yrs is also discussed. SYR

15 Gupta (NK). Automation in flour mills. A perspective. Indian Miller 20(1); 1989; 46-50, 52-53

Automation of flour mills could be basically effected by (i) dedicated processors, (ii) computers, and (iii) programmable logical controllers (PLC). The PLC role is reviewed covering the memory size, problems arising from interfacing PLC system to a host computer, customers support and the capability of PLC's in start up and shut down procedure. It is concluded that the use of PLC's and associated systems can, in the long run, help save a considerable amount by increasing overall efficiency and production rates and quality improvement. KAR

ENERGY IN FOOD PROCESSING

Nil

FOOD CHEMISTRY AND ANALYSIS

Chemistry

16 Donnelly (JK), McLellan (KM), Walker (JL) and Robinson (DS). Superoxide dismutases in foods. A review. Food Chemistry 33(4); 1989. 243-270

In this paper the role of superoxide dismutases(SOD) in foods have been reviewed. This covers formation of superoxide and its reactivity in biological systems; superoxide in biological systems. The role of superoxide in production of a more reactive sp. occurence of SOD in foods. Heat stability of SOD in foods; food irradiation and SOD. The biological distribution of SOD (Enzyme types), properties of the metalloforms of SOD; mechanism of enzyme catalysed dismutation; the protective role of SOD in plants; structure of SOD; measurement of SOD. NGKR

17 Fourie (PC) and Basson (DS). Predicting occurrence of rancidity in stored nuts by means of chemical analyses. Lebensmittel-Wissenschaft und-Technologie 22(5); 1989; 251-253

Almond, pecan and macadamia nuts were stored for 16 months at 30 C and a relative humidity of 55%. Rancidity was determined by a trained lab. panel and peroxide and iodine values determined at 2 monthly intervals, starting at 0 months. Specific changes in peroxide values coincided with the onset of rancidity as determined by the taste panel. AS

18 Heinonen (MI), Ollilainen (V), Linkola (EK), Varo (PT) and Koivistoinen (PE). Carotenoids in Finnish foods. Vegetables, fruits, and berries. Journal of Agricultural and Food Chemistry 37(3); 1989; 655-659

This paper describes the results of study of 69 items of fruits, vegetables, berries, mushrooms for their carotenoids analysed by HPLC method. Results showed that lutein and beta-carotene were the predominant carotenoids in all samples except rutabaga, celeriac, mushrooms and raisins. Lutein was highest in green vegetables parsley, celery, dill and spinach (less than or equal to 4400 μ g/100g). Whereas carrot, parsley, dill, spinach, broccolli, leek, celery, sweetned pepper, tomato ketchup and chantarelle were very rich in beta-carotene (1000-7600 μ g/100 g) and thus contribute to vitamin A activity expressed as retionl. A range of alpha-carotene (12-530 μ g/100 g) was present in carrot, bean, sweet yellow pepper, orange mandarin, banana, avacado., cloudberry, raspberry frozen corn, and

prune and gamma-carotene was found only in tomato where lycopene was predominant carotene in tomato ketchup. The variations in beta-and alpha-carotene lutein and lycopene was studied in carrot, lettuce, and tomato in market samples. NGKR

Chemistry(Analytical)

19 Baucells (M), Lacort (G), Roura (M), Farre (R) and Lagarda (J). Determination of chromium in foods by flame atomic absorption and inductively coupled plasma spectrometry. Nahrung 33(2); 1989; 225-228 (De).

20 Holder (J) and McCreadie (S). A moving phase. Part 2. Food 11(6); 1989; 41, 43

The article describes briefly about five type of liquid chromatography and their applications in food industry. These include adsorption chromatography, liquid-liquid chromatography, ion-exchange chromatography, affinity chromatography and the HPLC system. SYR

21 Jaeggi (NE), Brunner (R) and Schmidt-Lorenz (W). DEFT-Technique in the analysis of foods. I. Pretreatment and enzymatic digestion. Acta Alimentaria 18(1); 1989; 71-77

For the analysis of foods by the direct epifluorescent filter technique (DEFT) a var. of homogenised foods was rendered filterable by sedimentation, centrifugation and prefiltration through nylon mesh filters. Centrifugation of food suspensions resulted in good clarification but poor microorganisms recovery. A combined sedimentation and prefiltration process yielded good clarification and also good microorganism-recovery. The elimination of food debris was further enhanced by adding enzymes and the surfactant Triton. Protease readily degraded cream, yoghurt, mineral meat and frozen fish, whereas the application of amylase was only partially successful in degrading precooked pasta, frozen peas, patisserie and ground pepper. AS

22 Jaeggi (NE), Brunner (R) and Schmidt-Lorenz (W). DEFT-technique in the analysis of foods. II. Agreement with the standard plate count. Acta Alimentaria 18(1); 1989; 79-88

A var. of foods was analysed by the direct epifluorescent filter technique (DEFT) after attaining filterability through prefiltration and enzymatic digestion. DEFT-counts of pasteurized milk, pasteurized cream, minced meat and frozen fish were in agreement with the results of the standard plate count, whereas correlation was low in precooked pasta, frozen peas, patisserie and canned ravioli. Reasons for low correlations between the two methods are discussed. Variation of the DEFT-count is predominantly caused by the uneven distribution of microorganisms on the membrane filters. A sampling scheme using duplicate filters with 15 counts per filter reduces the standard error of the mean count to below 20%. AS

23 Mirza (ML), Wadood (A) and Shahnaz Bibi. A spectrometric assay procedure for estimation of fructose in presence of glucose. Journal of

the Indian Chemical Society 65(11); 1988; 818-819

A sensitive and accurate method has been developed for estimating fructose. in presence of glucose which consists of using 0.5% pyrogallol/0.5% resorcinol in varying concn. of either HCl or phosphoric acid. These reagents made colour complexes with fructose whereas glucose did not produce colour. A micro quantity (30 μ g) of fructose can be estimated if 12 M HCl is used as dehydrating agent. However, the sensitivity is reduced if conc. phosphoric acid is used, where 300 u g fructose can be estimated. KAR

FOOD MICROBIOLOGY AND HYGIENE

Enzymes

24 Fukal (L), Kas (J) and Rauch (P). Immunochemical assays of enzymes in foodstuffs. Food Reviews International 4(2); 1988; 195-209

This paper reviews immunochemical methods used in the field of food science and biotechnology. Covers mutual relation between catalytical activity and immuno-reactivity of enzymes, immunochemical methods in the analysis of cereal and malt enzymes, immunochemical assay of enzymes in beer, immunochemical identification and detn. of rennet proteinases, immunochemical assay of enzymes in milk, immunochemical inspection in industry, immunochemical assay of other enyzmes, immunosorbents in enzymology. 70 references. SRA

25 Turecek (PL), Buxbaum (E) and Pittner (F). Enzymatic quantification of pectins. Chemie Mikrobiologie Technologie der Lebensmittel 12(2); 1989; 39-40 (De).

A two step quantitative assay of pectins using pectin depolymerising enzymes ("pectinase") and L-rhamnose dehydrogenase is described. AS

Fermented foods

26 Chen (T). Past, present, and future of Chinese fermented food products. Food Reviews International 5(2); 1989; 177-208

This paper discusses the historical aspects, the manufacturing technology, and the future outlook on fermented food products in China. 7 references. SRA

Microorganisms

27 Adams (MR), Hartley (AD) and Cox (LJ). Factors affecting the efficacy of washing procedures used in the production of prepared salads. Food Microbiology 6(2); 1989; 69-77

External leaves of whole lettuce were found to have counts approx. 1 log cycle higher than subsequent inner leaf layers. A

standard washing in tap water resulted in the removal of an average of 92.4% of the lettuce leaf microflora. Inclusion of 100 Mg l^{-1} (pH c. 9) available free chlorine reduced the count by 97.8%. Adjusting the pH of hypochlorite solutions from 0. 9 to 4.5-5.0 with inorganic or organic acids produced a 1.5-4.0 fold increase in the microbiocidal effect. Increasing the washing time in hypochlorite from 5 to 30 min did not decrease microbial numbers further whereas extended washing in tap water produced a reduction comparable to hypochlorite. Addition of a surfactant, Tween 180, to hypochlorite reduced microbial numbers by 99.6% but resulted in organoleptic differnces. Failure of conventional water and hypochlorite washing to remove more of the microflora is ascribed to the survival of bacteria in protective hydrophobic pockets or folds in the leaf surface and some supportive electron microscopy evidence is presented. AS

28 Jaeggi (NE), Simes (V) Hughest (D). Evaluation of a television image analyser as an aid to estimation of microbial numbers in food using the direct epifluorescent filter technique. Food Microbiology 6(2); 1989; 85-91

Seventy food samples (23 samples of raw milk, 24 samples of minced meat and 23 samples of unsalted butter) were examined using the direct epifluorescent filter technique (DEFT). For each sample, microorganisms captured on duplicate filters were counted both by eye and with the aid of Bio-Foss 40 -10 image analyser. Each count was performed by two operators. The correlation coeff. for the image analyser counts against the manual DEFT count for the 3 products ranged from 0.94 to 0.98. An analysis of variance indicated that both counting methods were equivalent in their repeatability. Operator experience and the quality of the microscopic image were important factors in determining the accuracy of the automatic count. AS

29 Meyer (RS), Grant (MA), Luedecke (LO) and Leung (HK). Effects of pH and water activity on microbiological stability of salad dressing. Journal of Food Protection 52(7); 1989; 477-479

The water activity and pH of an exp. starch-based salad dressing were varied to evaluate inhibitory effects on microorganisms selected from groups known to be principal dressing spoilage agents. Dressing samples were inoculated with Lactobacillus fructivorans, Zygosaccharomyces bailii, or a yeast isolated from spoiled commercial salad dressing. Both yeast and L. fructivorans displayed a min. growth pH of approx. 3.55 to 3.60. The min. water activity observed was 0.89 for yeast growth and 0.91 for L. fructivorans. Combinations of water activity and pH which imparted microbial stability without use of preservatives are described. AS

30 Peterkin (PI), Conley (D), Foster (R), Lachapelle (G), Milling (M), Purvis (U), Sharpe (AN) and Malcolm (S). A comparative study of total coliform recovery from foods by most probable number and hydrophobic grid membrane filter methods. Food Microbiology 6(2); 1989; 79-84

A comparative study of the most probable number and the

hydrophobic grid membrane filter methods for the recovery of total coliforms in foods was carried out by five Health Protection Branch lab. A total of 47 samples of food, consisting of 172 sample units, was analyzed by the two methods. The study shows that in general the methods are not significantly different, but that in some situations the hydrophobic grid membrane filter method yields higher colifrom counts in foods. AS

Alage

31 Chamorro (GA) and Salazar (M). Dominant lethal assay of Spirulina maxima in male CD-1 mice after short term and prolonged-term feeding. Journal of Food Protection 52(2); 1989; 125-127

Feeding spirulina alage at 10, 20 or 30% levels to adult CD-1 mice ror 5 days or 10 wks, followed by mating did not affect pre-implantation losses, and non living implants failed to reveal dominant lethal effects. CTD

Dunaliella bardawil

32 Mokady (S), Abramovici (A) and Cogan (U). The safety evaluation of Dunallella bardawil as a potential food supplement. Food and Chemical Toxicology 27(4); 1989; 221-226

This paper presents results of study with rats raised on diets containing dehydrated alga Dunaliella as dietary supplement. Algae D. bardawil grown in sea water was harvested by centrifugation and drum dried. This algae used in feeding tests were analysed for minerals nucleic acids, heavy metals and beta carotene and the safety of this alga for food use was evaluated by raising four generations on diets containing 0, 5 or 10% dehydrated material. Each group comprised 10 males and 20 females. No significant differences were observed between rates consuming algae and the controls of any generation in general appearance, behaviour growth, reproductive performance or gross pathology. No appreciable differences between the experimental and control animals and the only difference in this pathology observed was decrease in chronic inflammation and an increased frequency of focal bronchoprenmonia in rats fed 10% algae compared to controls. This showed the safety of D. bardawil for human consumption. NGKR

Fungi

Mushrooms

33 Albisu (I), King (RD) and Kozlov (IA). Inhibition of the catecholase activity of mushroom tyrosinase by carbon monoxide. Journal of Agricultural and Food Chemistry 37(3); 1989; 775-776

This work was undertaken to investigate the effect of carbon monoxide on mushroom tyrosinase activity. The catecholase activity of tyrosinase extracted from freeze dried mushroom powder was found to be reversibly inhibited by carbon monoxide. Dissociation of the

carbon monoxide-enzyme complex was followed at various pHs between 4.0 and 8.0. The minimum value of the first order rate constant for this reaction coincides with the pH of the max. catecholase activity pH 6.5. Carbon monoxide treatment of the enzyme extracts prevented the self inactivation of the enzyme. NGKR

Hygiene

Bacteria

34 Lee (RM) and Hartman (PA). Optimal pyruvate concentration for the recovery of coliforms from foods and water. Journal of Food Protection 52(2); 1989; 119-121

Recoveries of coliforms in water and food samples were increased by adding sodium pyruvate to the Tryptic Soy Agar (TSA) base layer, and Violet Red Bile (VRBA) overlay, of the Modified VRBA procedure described in Standard Methods for the Examination of Dairy Products. Six pyruvate levels (0, 0.005, 0.01, 0.05, 0.1 and 1.0%) were tested. Counts were significantly lower (P less than or equal to 0.05) on media containing 0% and 1.0% pyruvate than on the other media. Although 0.05% yielded the highest counts overall, there were no significant differences (P less than or equal to 0.05) among 0.005, 0.01, 0.05, and 0.1% pyruvate. Analysis by using a general linear model procedure revealed that 0.02% pyruvate was the statistically predicted optimal level to use in the Modified VRBA procedure. AS

Escherichia coli

35 Romick (TL), Lindsay (JA) and Busta (FF). Evaluation of a visual DNA probe for enterotoxigenic, E. coli detection in foods and wastewater by colony hybridization. Journal of Food Protection 52(7); 1989; 466-470

A visual DNA probe for the detection of enterotoxigenic E. coli (LT EEC) by colony hybridization was evaluated to determine its efficacy as a more restrictive, routine indicator method for foods and wastewater. The E. coli heat labile enterotoxin (LT) gene was used as the DNA probe to detect LTEEC. In control experiments the reliability of the probe was demonstrated with food spiked with LT EEC. Raw oysters and wastewater examined for naturally occurring LT EEC showed significant levels of probe positive isolates. Despite some problems, for example background noise associated with food type, the DNA probe proved satisfactory as a method for indicating the presence of enterotoxigenic Enterobacteriaceae. AS

Listeria

36 Farber (JM), Sanders (GW) and Johnston (MA). A survey of various foods for the presence of Listeria species. Journal of Food Protection 52(2); 1989; 456-458

Various retail foods were analyzed for the presence of Listeria

spp. One hundred ten samples of vegetables including lettuce, celery, tomatoes, and radishes, and 14 samples of pasteurized milk, were found to be free of L. monocytogenes. In contrast 9 of 16 (56.3%) chicken legs, 38 of 44 (86.4%) ground meats, and 6 of 30 (20%) fermented sausages contained the organism. Of 530 samples of ice-cream products obtained at the manufacturing levels, only 2 were positive for L. monocytogenes. AS

Pseudomonas

37 Freedman (DJ), Kondo (JK) and Willrett (DL). Antagonism of foodborne bacteria by Pseudomonas spp. A possible role for iron. Journal of Food Protection 52(7); 1989; 484-489, 495

Antagonistic action of Pseudomonas spp. against foodborne spoilage and pathogenic bacteria was studied to determine mechanisms involved in the establishment of dominance by these organisms in food systems. Thirteen Pseudomonas strains from plant and food origin were tested for the ability to inhibit other Pseudomonas spp. on brain heart infusion agar using a bacteriocin screening assay. P. aeruginosa AA was the most active, inhibiting P. phaseolicola, P. pisi, P. putida, P. fluorescens and P. fragi strains. When testing for antagonism against non-pseudomonads, four Pseudomonas spp. showed wide spectrum activity against a var. of gram positive and gram negative bacteria. Growth of most Pseudomonas spp. on an iron-deficient medium increased antagonism. In assays conducted in liquid media, inhibitory activity varied greatly as a result of the comp. of the media. A minimal media extract from a P. aeruginosa AA culture significantly inhibited the growth of P. fluorescens and Staphylococcus aureus in milk. AS

Salmonella

38 Nath (EJ), Neidert (E) and Randall (CJ). Evaluation of enrichment protocols for the 1-2 Test™ for Salmonella detection in naturally contaminated foods and feeds. Journal of Food Protection 52(7); 1989; 498-499

The 1-2 test™ system was used to detect Salmonella in naturally contaminated foods and feeds. The results were compared with the official Canadian Wet Culture Method. In Phase I, the analytical procedure used for the 1-2 test™ was that suggested by the manufacturer. For both methods, 196 food and feed samples were analyzed. Thirty-four samples were found positive by the Wet Culture Method but only 26 were found positive by the 1-2 test™ an enrichment stage using tetrathionate brilliant green broth. Of the 314 samples analyzed, 84 samples were found to be positive. There were 79 samples found positive by both methods. In the remaining were positives, 3 tested positive only by the 1-2 test™, and 2 tested positive only by the Wet Culture Method. The majority of positive samples in Phase II were animal feeds. The selective enrichment modification to the 1-2 test™ procedure has enhanced its reliability for Salmonella detection in foods and feeds. The manufacturer's current procedure specifies a selective enrichment step. AS

BIOTECHNOLOGY

39 Harlander (S). Food biotechnology. Yesterday, today and tomorrow. Food Technology 43(9); 1989; 196-202, 206

This article will explore the potential implications of biotechnology for the food processing industry. It includes a brief history of this revolutionary new science, a discussion of research currently in progress, and a look at how food biotechnology could be used in the next 50 yrs to meet the demands of the consumer driven market place. 20 references. SRA

TISSUE CULTURE

Nil

FOOD ADDITIVES

Nil

CEREALS

40 Chen (C), Chiang (YP) and Pomeranz (Y). Image analysis and characterisation of cereal grains with laser range finder and camera contour extractor. Cereal Chemistry 66(6); 1989; 466-470

An image analysis system with the capability to acquire and combine three- dimensional laser range data and two- dimensional camera contour extracted images was used to discriminate between cereal grains and weed seeds and between soft white and club wheats, two- and six- rowed barleys, and rye and triticale kernels. Discriminant functions were established to discriminate between wheat and non-wheat with 99.5% accuracy and between non-wheat and wheat with 98.3% accuracy. The discrimination between two soft white and two club wheats was about 90% accurate. The discrimination between two- and six- rowed barley was about 90% accurate, between barley and other grains 97% accurate, and between rye triticale, and other grains 90% accurate. Discrimination between wheat, soybeans, oats, wild oats, dent corn, flint corn, wild buckwheat, sorghum, and lamb's quarter was almost 100% accurate. AS

41 De Buckle (TS). Composite flours. Prospects for their application in developing countries - The case of the Andean pact countries. Food Reviews International 4(2); 1988; 237-267

42 Fellers (DA) and Bean (MM). Composite flours. Food Reviews International 4(2); 1988; 213-235

Aspects covered include wheat import habit, FAO composite flour program, composite flours in the developed world, case-study of traditional macaroni in the United States, wheat situation in developing countries, and problems in implementing a national composite flour programme. 34 references. SRA

43 Lawton (JW) and Faubion (JM). Measuring kernel hardness using the tangential abrasive dehulling device. Cereal Chemistry 66(6); 1989; 519-524

A test is described that uses the Tangential Abrasive Dehulling Device (TADD) to measure grain hardness. Percent kernel wt. loss during milling follows a first-order decay model. The rate constant from the model is used as a measure of kernel hardness. The rate constant was shown to discriminate kernel hardness in sorghum, wheat, and corn samples. Kernel moisture above 12.5% was shown to raise the rate constant significantly; however, this effect could be reversed by drying the grain before testing. Kernel size also raised the rate constant, but this effect was significant only for very small kernels. AS

44 Lehrfeld (J). HPLC analysis of phytic acid on a pH stable, macroporous polymer column. Cereal Chemistry 66(6); 1989; 510-515

A procedure was developed that enables up to 60 samples containing phytic acid to be analyzed in one day. Extraction time was reduced to 1-3 min per sample by using ultrasonic irradiation. Concn. of the extract was simplified by using a commercially available silica-based, anion-exchange column. High-performance liquid chromatography analysis of the concentrated sample on a macroporous polymer column was accomplished in 8 min. The column easily resolved mixtures containing inositol hexaphosphate, inositol pentaphosphate, and inositol tetraphosphate. Samples of wheat bran as small as 50 mg were analyzed by this system. AS

45 Moran (P) and Westgate (GR). A pneumatic static pressure transducer for cereal grains. Journal of Agricultural Engineering Research 40(4); 1988; 237-244

A pneumatic transducer has been designed for measuring the static stress imposed by cereal grain on full-scale retaining walls. The transducer was intended to be used in positions which are completely inaccessible when a grain store is filled. It is connected to both its air supply and the air pressure measuring instruments by four small-bore air transmission tubes only. The technique for taking stress measurements identifies the null deflection point of the transducer's force balance system and thereby renders measurements free from errors due to local strains in the retained granular material. When fitted with a 106 mm diameter face plate the transducer is capable of measuring stresses of up to 25 KPa to within an estimated standard error of 5%. AS

46 Ng (PKW), Slominski (E), Johnson (WJ) and Bushuk (W). A new perspective on glutenin structure based on fractionation by free-flow preparative isoelectric focusing. Cereal Chemistry 66(6); 1989; 536-537

The free-flow preparative isoelectric focussing technique applied to study the HMW subunits of glutenin from the flour of cv. Neepawa showed several different polymers that have different isoelectric points and hence was possible to fractionate these by isoelectric focussing. The results suggest that the glutenin, in addition to polymeric molecules comprising different numbers and different types of subunits, some HMW proteins exist in flour in single polypeptide form. AR

Barley

47 Aman (P), Graham (H) and Tilly (A-C). Content and solubility of mixed-linked (1-3), (1-4)- beta-D-glucan in barley and oats during kernel development and storage. Journal of Cereal Science 10(1); 1989; 45-50

The concn. of mixed linked (1-3), (1-4)-beta-D-glucan (mixed linked beta-glucan) increased during kernel development of two-rowed and six-rowed barley, with a levelling off or decrease at later stages of maturity. Consequently, the stage of development as well as cvs and growing conditions influenced total mixed linked beta-glucan content. In barley and oat kernels, dry matter was largely deposited before the majorty of mixed linked beta-glucan in the endosperm cells walls was synthesized. High contents of soluble mixed-linked beta-glucan as well as high mixed-linked beta-glucan solubilities were observed before harvest. Close to harvest and early during subsequent storage significant decreases in total and soluble mixed linked beta-glucan contents were apparent. During the remainder of the 6 month storage time studied, however, the contents of soluble and insoluble mixed-linked beta-glucan remained constant, indicating no activity of endogenous mixed-linked beta-glucan degrading enzymes. AS

48 Franconi (J-M), Naulet (N) and Martin (G-J). Natural factors of site-specific isotope fractionation of hydrogen in the fermentation products (ethanol and water) of barley. Journal of Cereal Science 10(1); 1989; 69-80

The influence of environmental conditions on the isotopic fractionation of hydrogen which occurs in the course of the development of cereals has been investigated using barley as a model. The site-specific deuterium contents of ethanol and water resulting from the fermentation of barley are reliable probes for the isotopic content of barley starch. It was shown that the isotopic parameters of the fermentation medium are independent of the state of the raw material and its conversion to ethanol. The differences in the results corresponding to fermentation of grains or malts or to conventional brewing are explained on the basis of variations in the isotopic ratio in the starting water or in the initial concn. of sugars. In

most cases no significant influence of the specific barley var was detected, However, some deuterium depletion was observed for the spring var. as compared to the winter var. Although there was no geographical effect (within the limited climatic range of the sites used), there was significant year-to-year variation in the isotopic ratios. There effects are rationalized on the basis of the meteorological conditions, characterized in particular by temp. and precipitation parameters. This study has confirmed that the site specific natural isotope ratios provide powerful analytical criteria for the characterization of cereals and of their derived products. AS

49 Henry (RJ). Factors influencing the rate of modification of barleys during malting. Journal of Cereal Science 10(1); 1989; 51-59

The modification of samples of 41 different barley var. was assessed by staining with Calcofluor following steeping and 48 h of germination. Endosperm modification at this stage varied from 10.3 to 56.2%. Modification was related significantly to alpha-amylase and especially beta-glucanase levels in the partly malted barley but not to grain size or protein content. Variation in beta-glucanase levels explained half the observed variation in modification. However, alpha-amylase and beta-glucanase levels were closely correlated ($r = 0.93$). High beta-glucan barleys modified less completely, a smaller proportion but a higher absolute amount of their beta-glucan being degraded. Small grained barley produced relatively higher concn. of hydrolytic enzymes but did not necessarily exhibit greater modification at this stage. The positive correlation of high beta-glucanase and low beta-glucan content with modification suggested that these factors may determine the rate of modification. However, some samples especially those with small grains, modified less than would be expected from their beta-glucanase and beta-glucan contents, suggesting a role for other factors possibly related to endosperm structure. AS

Oats

50 Shea Miller (S), Fulcher (RG) and Altosaar (I). Evaluation of 4-methylumbelliferyl heptanoate as a substrate for oat lipase. Journal of Cereal Science 10(1); 1989; 61-68

The fluorogenic substrate 4-methylumbelliferyl heptanoate (MUH) has been reported to be suitable for measurement of lipase activity in cereal grains. In the present study, MUH hydrolysis was compared with a conventional lipase assay which measured the release of free fatty acids (FFA) from endogenous substrates in oats. Correlations of release of free fat $r = 0.83$ and $r = 0.94$ were domonstrated between the two assays during heat treatment to inactivate hydrolases. A correlation of $r = 0.71$ was observed between the two assays in a survey of 21 domestic cvs of mature, ungerminated oats. However, the range of activities for the two assays was different. A fivefold variation in lipase activity, and a twofold variation in MUH hydrolysis were noted. Incorporation of the esterase inhibitor di-isopropylfluorophosphate (DFP) into the reaction mixtures indi-

cated that the MUH assay was measuring primarily esterase activity. It was concluded that the MUH assay is not a valid measure of lipase activity in oats. AS

Rice

51 Bajaj (M) and Sindhu (JS). Extended milling of Indian rice. II. Effect of cooking and sensory quality characteristics. Chemie Mikrobiologie Technologie der Lebensmittel 12(2); 1989; 46-51

The cooking and sensory quality of five promising varietal lines and one var. of rice of 1982 crop, as affected by extended milling was carried out. A significant reduction time in cooking time of milled rice in comparison with brown rice was observed. Elongation ratio, water uptake ratio and gruel solids loss increased significantly, when the brown rice was subjected to extended milling. The coeff. of correlation of degree of polish with water uptake ratio, elongation ratio and gruel solids loss were statistically highly significant and ranged from +0.88 to +0.99, +0.88 to +0.98 and +0.91 to +0.99, resp. Punjab Basmati No. 1 rice had the best cooking and sensory quality as it cooked individual kernels with max. elongation ratio, which increased significantly with extended milling. AS

52 Capanzana (MV) and Malleshi (NG). Studies on malting of rice. ASEAN Food Journal 4(3); 1989; 111-115

Ungerminated control rice had a negligible level of alpha-amylase activity whereas germination resulted in the development of a considerable amount of activity, attaining a peak on the 5th day of germination. However, dry matter loss increased as germination progressed. Malted rice had slightly lower levels of protein and ether extractives and was softer than the ungerminated control sample. Kilning the 3-day germinated green malt at 70 C for about 60 min in a coffee roaster and dehusking the kilned malt in a rubber roller sheller gave malt of desirable flavour and taste. The malt flour had very low cooked paste viscosity as compared to ungerminated, expanded, puffed and flaked rice flours indicating its suitability for use as a base material in low dietary bulk weaning foods. SRA

53 Chandrasekhar (PR) and Chattopadhyay (PK). Heat transfer during fluidized bed puffing of rice grains. Journal of Food Processing and Preservation 11(2); 1989; 147-157

In this investigation the development of pneumatic rice puffing machine for increasing the production capacity of puffed rice and the knowledge of the heat transfer process during process have been described. Experiments have been carried out to determine the physical properties of the rice grains and other fludization parameters necessary for this study. The results showed the surface heat transfer coeff. in case of hot air fluidized bed puffing to be 155.39 w/m^2 K and the calculated grain surface temp. for puffing to be about 170 C which did not vary significantly for experimental puffing air temp. range of 200-270 C. The optimum conditions for higher expansion

ratio (8.5 to 10) and better colour of the product, were air temp. ranging from 240 to 270 C with exposure time of 9.7 S to 7 S. NGKR

54 Majaj (M), Arora (CL), Chhibba (IM) and Sindhu (JS). Extended milling of Indian rice. III. Effect of mineral composition. Chemie Mikrobiologie Technologie der Lebensmittel 12(2); 1989; 58-60

The loss of minerals during extended milling of four important varietal lines and one var. of Indian rice is reported in this paper. The loss of P, K, Ca, and Mg during extended milling ranged from 53 to 71, 50 to 74, 57 to 96, and 62 to 96%, whereas that of Zn, Cu, Fe, Mn and B ranged from 43 to 58, 11 to 30, 39 to 57, 33 to 59, and 33 to 58%, resp. Rice contained significant quantities of these minerals, particularly P, K, Mg, Cu, and Mn, even in the white polished form. AS

55 Reyes (VGJr) and Jindal (VK). Conduction heating of high moisture rough rice. III. Changes in milling and cooking qualities. Journal of Food Processing and Preservation 11(2); 1989; 103-105

In this investigation the changes in head yields, whiteness and cooking qualities of rice due to conduction heating carried out for fungal inactivation have been studied. This rough rice had moisture range 18-30% wet basis. The results revealed an increase in head rice yields of heat treated samples accompained by a reduction in milled rice whiteness and improvement in cooked rice texture. Heat treatments of rough rice corresponding to fungal inactivation level of 9.5% resulted in highest head rice yields and acceptable level of reduction in the whiteness of milled rice. The changes in cooking quality were similar to the changes observed in rough fresh rice due to natural aging. NGKR

Wheat

56 Dachkevitch (T) and Autran (J-C). Prediction of baking quality of bread wheats in breeding programs by size-exclusion high performance liquid chromatography. Cereal Chemistry 66(6); 1989; 448-456

Size exclusion high performance liquid chromatography (SE-HPLC) was employed to analyse the unreduced protein extracts for assessing the baking quality of bread wheat genotypes which has great potential in breeding programs. A large number of expt. based on this method for assessing the baking quality showed that the best indicators of the potential baking strength of the genotypes were generally % F_1 or F_1 , F_2 ratios. But the loaf vol. in French baking technology was mostly related to the F_2 fraction. Nevertheless the prediction equation of baking strength must be calibrated from samples of each new crop year. AR

57 Irving (DW), Folcher (RG), Bean (MM) and Saunders (RM). Differentiation of wheat based on fluorescence, hardness, and protein. Cereal Chemistry 66(6); 1989; 471-477

Fluorescence intensity, hardness, and protein data on whole

wheat flours were analyzed using a discriminant function to classify wheats. Six classes and subclasses of wheat were represented in a set of 77 samples. When red wheats and durum were considered, a high correlation ($r = -0.907$) between hardness and fluorescence was obtained; when white wheats were included, the correlation dropped ($r = -0.05$). Discriminant analysis allowed separation of wheat into proper classes for 100% of durum, hard red spring, club, soft red winter, and soft white winter wheats; and for 94% of hard red winter wheat. AS

Wheat bran

58 Feng (Y) and McDonald (CE). Comparison of flavonoids in bran of four classes of wheat. Cereal Chemistry 66(6); 1989; 516-518

Flavonoids from bran of hard red spring, hard red winter, durum, and white wheats were extracted with diluted NaOH solution (pH 11). They were purified by chromatography on Amberlite XAD-2 resin and A Sephadex G-15 column followed by paper chromatography with two different solvents. The properties of the hard red winter, durum, and white wheat flavonoids were identical in chromatography R values, ultraviolet spectra, and fluorescent colour to those of Len, a variety of hard red spring wheat in which the flavonoid was earlier purified and identified as 6, 8-di-C-glycosylapigenins. Finally, after partly purifying on the Amberlite XAD-2 column, the flavonoid contents of nine wheat varieties were measured by ultraviolet spectrometry at 405 nm. AS

Wheat flour

59 Finney (KF). A five-gram mixograph to determine and predict functional properties of wheat flours. Cereal Chemistry 66(6); 1989; 527-530

Described is a 5-g mixograph to determine and predict functional properties of wheat flours. Mixograms from the 5- and 10-g instruments were entirely comparable and high replicable. A mixogram time-to-peak difference of 0.276 min between any two single values is required for significance at $p = 0.05$. The 5-g instrument has several structural improvements not on previous 10-g models. Mixograms of flours representing a wide range in mixing time to peak and in protein content were comparable for the 5- and 10-g instruments. AS

60 Horvath-Almassy (K). Investigation of the additivity of flour characteristics in two-component wheat flour mixtures. Acta Alimentaria 18(1); 1989; 19-30

Baking quality, pastry and protein properties of two-component wheat flour mixtures were tested in model exp. The four basic flour samples comprised a wide range, almost three orders of baking quality (Jubilejnaja 50, MV 8, Baranjka and GK Csilla of the yr 1986). It was established that some of the characteristics additioned in the course of mixture means a high correlation between the properties as measured or calculated on basis of comp. Properties studied were:

water absorption capacity, valorigraph value, SDS sedimentation value. However, other properties (loaf vol., largest cross-section), important from the point of view of the final product, did not prove additive at all. Results corresponded highly with the experiences of Bolling (1980). The exp. permit the conclusion that the rheological properties of the pastry or the gluten of individual flours highly affect the baking quality of the mixture obtained from them. The mixture of a flour producing short, firm texture and another containing softened gluten may give a loaf of optimal vol. although the quality of the two flours is far from optimal. The results point to the importance of the rheological properties of wheat true to var. for the baking industry. The deliberate utilization of the combinative capacity of different flours may improve the economicalness of the milling and baking industries while simultaneously satisfying the requirements of the consumer. AS

Wheat proteins

61 Gabor (E). Determination of wheat protein by a new spectrophotometric method. Acta Alimentaria 18(1); 1989; 31-35

A new spectrophotometric method was elaborated to determine the protein content of wheat. The principle of the method is based on the light absorption of the protein solution, which is proportional to the protein quality present. The examined material was digested with formic acid at 100 plus or minus 1 C for 60 min. After cooling, ethanol and methylene chloride were added to the reaction mixture. The spectrophotometric solution was made from this suspension by adding formic acid to it. The non-dissolved bran residues were filtered off before measurement of the optical density of the solution. Calibration measurements were carried out by means of the Kjeldahl method for the calculation of protein content. Mathematical evaluation demonstrated the good aplicability of the spectrophotometric method. AS

Gliadins

62 Lukow (OM), Dyck (PL) and Bushuk (W). Possible linkage of falling number value with gliadin proteins in wheats with genes for improved sprouting resistance. Cereal Chemistry 66(6); 1989; 531-534

The gliadin electrophoregrams of each of the 93 random lines of the parcut wheat RL 4137 and the cv. Neepawa, which have high resistance to preharvest sprouting; showed four distinct protein banding patterns. A possible linkage between the high mobility gliadin bands and the falling number values (FN) was indicated. However, prescreening of early sensation lines for these bands and also determining the FN values of the selected lines increases. The efficiency of the selection of lines of improved sprout resistance. AR

Glutens

63 Wadhawan (CK) and Bushuk (W). Studies on vitality of commercial gluten. Part 1. Physical, chemical and technological characteris-

tics. Cereal Chemistry 66(6); 1989; 456-461

Twenty-seven samples of commercial vital gluten were subjected to various physical, chemical, and technological tests in an attempt to develop a rapid, simple test of vitality for breadmaking purposes. Coeff. of correlation were calculated between test parameters and vitality as measured by the baking test. Of the compositional parameters, sodium content and the ratio of bound lipid to free lipid were significantly positively correlated to vitality of gluten. Of the physical characteristics, force required to stretch a sample of wet gluten was highly significantly correlated with vitality. AS

64 Wadhawan (CK) and Bushuk (W). Studies on vitality of commercial gluten. Part II. Solubility, fractionation, electrophoresis, and fluorescence results. Cereal Chemistry 66(6); 1989; 461-466

Osborne solubility fractionation of commercial vital glutens showed that samples containing more insoluble residue protein gave poorer baking performance (i.e., lower vitality). Devitalized glutens prepared by heating at elevated temp. contained the greatest amount of insoluble residue. The proportion of acetic acid soluble protein was directly correlated to vitality of gluten. Electrophoresis patterns were altered upon devitalization. Intrinsic fluorescence of dry gluten increased upon devitalization; vitality was highly significantly negatively correlated to the intrinsic fluorescence value. Fluorescence of solution of acetic acid soluble fractions of vital gluten was high significantly correlated with vitality as measured by the baking test. AS

Wheat starch

65 Ellis (HS), Ring (SG) and Whittam (MA). A comparison of the viscous behaviour of wheat and maize starch pastes. Journal of Cereal Science 10(1); 1989; 33-44

The viscous behaviour of aqueous suspensions of gelatinised starch granules from wheat and maize has been investigated. The viscosity of the suspension relative to that of water is dependent on the vol. fraction occupied by the particles, their shape and deformability. The swelling and deformability of gelatinised wheat starch granules show a strong dependence on the heating rate employed to gelatinise the starch. For gelatinised starch pastes of wheat and maize it has also been shown that the solubilised polysaccharides make a contribution to the observed viscosity. AS

MILLETS

Corn

66 Singh (G). Pre-production development and fabrication techniques of tubular maize shellers. Journal of Agricultural Engineering 25(2); 1988; 107-114

An attempt has been made to modify the design of a tubular maize sheller to suit batch production techniques. Design of simple jigs and fixtures has also been described. These fabrication aids reduced the layout and dimensioning time considerably thereby increased vol. of production. The investment in jigs and fixtures was possible to recover in 120 units of tubular maize shellers. AS

67 Zayas (JF) and Lin (CS). Frankfurters supplemented with corn germ protein. Sensory characteristics, proximate analysis and amino acid composition. Journal of Food Quality 11(6); 1989; 461-474

Defatted corn germ protein (CGP) has been studied as a functional or substitute ingredient of frankfurters. The proximate composition (protein, fat, moisture, ash) and amino acid content of hexane- and supercritical corbon dioxide defatted CGP and frankfurters contaning CGP were determined. CGP was incorporated in frankfurters as in a powder, slurry form and as a stabilizer of emulsions. Proximate analysis showed significantly lower fat content of CGP processed by a modified procedure and a reduction of fat content in meats containing CGP. Levels of essential amino acid in CGP cmpared favorably to those in sodium caseinate, hen's egg protein, and soybean protein. Except for isoleucine, CGF meets or exceeds a FAO provisional amino acid pattern recommended for human consumption. No significant differences were found in amino acid comparision of hexane- or supercritical-carbon dioxided-defatted CGP. Amino acid comp. of frankfurters was not greatly altered by the addition of CGP at the level studied. An acceptable, weak corny aroma and taste could be detected at 2.4 and 3.5% levels of added CGP. Defatted CGP with its high protein content and amino acid pattern combined with relatively low cost has potential as an extender, fortifier, and binding agent in frankfurters and other comminuted meats. AS

Corn proteins

Glutens

68 Hardwick (JE) and Glatz (CE). Enzymatic hydrolysis of corn gluten meal. Journal of Agricultural and Food Chemistry 37(4); 1989; 1188-1192

In this study the kinetics of enzymatic hydrolysis of corn gluten meal have been presented. For this purpose the corn gluten meal was hydrolysed with Alcalase 2.4 L, an alkaline protease and the effects of enzyme concn. and gluten size reduction on the hydrolysis were studied. The extent of reaction was expressed in terms of both the degree of hydrolysis and the concn. of soluble protein (using the pH-stat technique). The models describe the time-dependent behaviour of three protein/peptide pools-insoluble protein TCA-insoluble proteins, and TCA-soluble peptides. A simplified product inhibition model was seen to give the best bit to the experimental data. NGKR

Lentils

69 Waczkowski (W), Sosulski (FW) and Hoover (R). Efficiencies of solvent systems for extraction of legume lipids. FAT Science and Technology 91(6); 1989; 233-236

Ten different solvent systems of variable polarity were used to extract total lipids from lentil flour and legume starches. Fractionation of the purified flour lipids showed that propanol/water extracted phospholipids and glycolipids quite efficiently but chloroform/methanol and benzene/ethanol gave high recoveries of both non-polar and polar lipids. N

Sorghum

70 Collins (JL),Draughon (FA) and Mccarty (IE). Destruction of microorganisms and deformation of plastic jars by hot sorghum syrup. Journal of Food Quality 11(6); 1989; 433-441

Sweet sorghum syrup was heated at 49 C to 71 C and filled into glass jars of 200 mL capacity that contained each of four microorganisms (Bacillus subtillis; Byssochlamys nivea: Saccharomyces rouxii; and Aspergillus niger) at 0, 1,000 or 10,000 CFU/mL syrup. Counts were determined on syrup immediately after filling into the jars and after four months storage. The heated syrup at all temp. significantly reduced the survival of bacteria and fungi at the time of filling. After four months, no bacteria could be detected in syrup at each temp., and no fungi could be detected at 66 and 71 C. The heat of syrup at 71 C or lower did not cause single layer polypropylene jars to become deformed; however, at 77 C and 82 C deformation occurred such that the jars were unsatisfactory for the packaging of syrup. Therefore, syrup can be filled at 66 C and 71 C into single layer polypropylene jars. At these temp., common spoilage microflora were destroyed or inactivated during storage, and the plastic jars did not become deformed. AS

PULSES

71 Dixon Phillips (R) and Abbey (BW). Composition and flatulence-producing potential of commonly eaten Nigerian and American legumes. Food Chemistry 33(4); 1989; 271-280

In this investigation the flatulence-producing potential of a cross-section of leguminous seeds commonly consumed in West Africa and in USA was measured and compared to their seed comp. Sixteen samples of dry, mature legume seeds representing eight sp. obtained from markets were cooked in boiling water until tender and freeze-dried along with cook water. The flatulence potential was measured as ml hydrogen produced per gram of legume solids consumed with rats housed in glass life-support chambers designed to collect hydrogen while supplying oxygen and then absorbing water and carbon dioxide.

Hydrogen was quantitatively measured by GLC using a molecular sieve column and mono-, di- and oligo saccharides determined by HPLC. Results showed that hydrogen production was positively correlated with xylose, fructose and starchy contents and negatively correlated with galactose and indigestible starch. NGKR

72 Duranti (M) and Giani (D). Proteolytic events in legume storage proteins. Acta Alimentaria 18(1); 1989; 89-96

The most significant proteolytic events which modify the storage proteins of lupin (Lupinus albus L.) seed during development to early stages of germination were investigated. Special emphasis was given to globulin 8, the major legumin like globulin of the seed. The first event considered is the post-translational breakdown of legumin precursor polypeptides (M_r around 70,000) occurring during seed development which gives rise to two polypeptides usually referred to as legumin acidic (40 000 to 50000 M_r) and basic (19 000 M_r) subunits. The second step is the partial proteolysis of the acidic subunits which can be also achieved in vitro by incubation with two endopeptidases from lupin resting seed. The role of this further cleavage is unknown, but it can be related to an altered association-dissociation behaviour of legumin oligomer. At early stages of germination of breakdown was more extensive and again only the acidic subunits appeared to be affected by the enzymatic proteolysis. AS

73 Gathehouse (AMR), Shackley (SJ), Fenton (KA), Bryden (J) and Pusztai (A). Mechanism of seed lectin tolerance by a major insect storage pest of Phaseolus vulgaris, Acanthoscelides obtectus. Journal of the Science of Food and Agriculture 47(3); 1989; 269-280

The bean weevil Acanthoscelides obtectus (Say) is a major storage pest Phaseolus vulgaris L (kidney haricot bean). The seeds of P. vulgaris contain high levels (up to 30 mg g^{-1} DM) of lectin, which has ben shown to be toxic towards larvae of the related bruchid storage pest of cowpea, Callosobruchus maculatus F. The lack of toxicity of this lectin towards larvae of A. obtectus is demonstrated. Unlike the strong binding of lectin to the midgut epithelium observed in larvae of C. maculatus, no binding of lectin molecules was found to occur in the gut epithelial cells of A. obtectus. This observation provides the basis for a hypothesis explaining the lack of toxicity of P. vulgaris lectin towards A. obtectus. Assays of proteolytic activity in gut homogenates of C. maculatus and A. obtectus suggest that the difference in susceptibility of the two insects towards the toxic effects of the lectinis not due to differential inactivation by proteolysis. Besides its effects on larval development, the lectin has a further effect at pupation, causing disruption of adipose tissues in C. maculatus but having no effect on A. obtectus. AS

Broad beans

74 Schreider (C) and Schmandke (H). Preparation of broad bean (Vicia faba L. minor) products. Part 4. Effects of recirculation of waste water on the quality of protein isolates. Nahrung 33(2); 1989; 177-

182

The isolation of proteins from broad bean flour is a water consuming process. The waste water of that consists of the supernatants after the isoelectric precipitation and washing. Different parts of those supernatant were recirculated into the process of protein extraction and isolation. The results show the possibility to recirculate 25% of the supernatant after the isoelectric precipitation and 100% of the supernatant after washing without any effect on the comp. of the protein isolates. AS

Chickpeas

75 Rembold (H), Wallner (P), Nitz (S), Kollmannsberger (H) and Drawert (F). Volatile components of chickpea (Cicer arietinum L.) seed. Journal of Agricultural and Food Chemistry 37(3); 1989; 659-662

This study was carried out to characterise headspace volatile material for identification of chickpea seed samples. (Cicer arietinum L., Fabaceae) indigenous to India, Pakistan, Iran, Ethiopia, Mexico and Mediterranean area. The head space material collected from floured chickpea seeds was analysed by capillary GC-MS spectrometry. It was possible to achieve structural assignment for 132 components of chickpea volatiles by these techniques and all the substances above 0.5% of the total volatiles except two could be identified. The comp. showed terpenoids (35%) and alcohols (18%) besides aliphatic hydrocarbons. By this method a total of 2.4 μg of volatiles was collected from 1.5 L of head space vol. and the main individual component was found to be alpha-pinene (= 0.3 μg). NGKR

Cowpeas

76 Akinyele (IO). Effects of traditional methods or processing on the nutrient content and some antinutritional factors in cowpeas (Vigna unguiculata). Food Chemistry 33(4); 1989; 291-299

The results of study on the effect of household preparation methods on the nutritive value of the various cowpea products have been presented in this paper. Cowpea (V. unguiculata) was processed into ẹwa, akara, moin-moin and gbegiri which are commonly consumed products in Nigeria by traditional methods. The proximate comp. trypsin inhibitor activity, oligosaccharides, phytate, energy values, minerals were analysed in the product by standard methods and stastically analysed. Results showed significant variation from each other in moisture and lipid content. The processing did not affect the protein but the calorie, ether extract, ash and N free extracts were affected by the method of preparation, wide variation was also found in the mineral contents. Gbegiri had the lowest phytate, oligosaccharides and trypsin inhibitor activity but lowest in nutrients. This showed that the traditional methods are adequate for max. nutritive values and acceptability. NGKR

Pigeon peas

77 Shepherd (H) and Bhardwaj (RK). Moisture-dependent physical properties of pigeon pea. Journal of Agricultural Engineering Research 35(4); 1986; 227-234

A non-linear relationship was observed kernel vol. and moisture content for pigeon pea. The best defined approx. shape was found to be prolate spheroid with an effective diameter of 4.83 mm, mean surface area 67.4 mm^2 , 1000 grain wt. of 76 g, and sphericity and roundness about 80% at 14.7% m.c.d.b. In the moisture range 6.3 to 28.2% d.b., the bulk and true densities were found to decrease linearly from 806 to 745 kg/m^3 and 1305 to 1251 $kg/,m^3$ resp., and porosity decreased linearly with bulk density from 40.4% to 38.2%. The angle of repose increased from 0.38 to 0.44 rad in the moisture range 5.8 to 14.7 d.b. The static coeff. of friction of pigeon pea against a galvanized steel surface increased from 0.26 to 0.37 in the moisture range 6.4 to 28.5%. d.b. AS

OILSEEDS AND NUTS

78 Sattar (A), Jan (M), Ahmad (A), Wahid (M) and Khan (I). Irradiation disinfestation and biochemical quality of dry nuts. Acta Alimentaria 18(1); 1989; 45-52

The effectiveness of radiation disinfestation of Pakistani nuts such as almond, groundnut, pine nut and walnut, was studied. Sp. of insects involved were determined. Concn. of potential nutrients, phytate, total P and Fe contents were determined. Tribolium castaneum and Sitotroga cerealella infested walnut and pine nut while Cadra cautella and Plodia interpunctella affected almond and groundnut, resp. Irradiation dose of 1.0 kGy completely checked infestation of these nuts. Sensory ratings decreased with advanced storage, and samples tested at 0.50 kGy were rated higher than others. Peroxidation rate was higher in pine nut and walnut than almond and groundnut. These nuts widely varied in the contents of potential nutrients such as protein, lipids, mineral matter, fibre and carbohydrates and exhibited wide range values of energy (2533-3102 kJ per 100 g), phytate (274.8-328.5 mg per 100 g), total P (268.5-604.0 mg per 100 g) and Fe (6.6-11.6 mg per 100 g). AS

Almonds

79 Soler (L), Canellas (J) and Saura-Calixto (F). Changes in carbohydrate and protein content and composition of developing almond seeds. Journal of Agricultural and Food Chemistry 37(5); 1989; 1400-1404

In this study the changes in comp. of developing almond are investigated in order to understand the physiological and morphological processes throughout maturation. The changes in moisture content fresh wt. and dry wt. of a kernel as well as water soluble sugars, sugar alcohols, cell wall constituents, protein, total amino acids, and free amino acids were determined in developing almond kernels (Prunus amygdaLus) at 3 wks intervals from March until harvest. It

was seen that a sharp drop in sugars from 60 to 56% dry wt.) was observed in a first stage. Reducing sugars were also seen to decrease from initial high percentages to a final trace level. The changes in hemicellulose, cellulose and lignin were also seen to be carbohydrate source during a period. The protein content increased steadily upto harvest more significantly during a 20 day period. The significant variations were found in amino acid content. The free amino acids were more in developing almonds whereas ripe kernels did contain insignificant amounts. NGKR

Groundnuts

80 Murugesu (V) and Basha (SM). Effect of salt concentration and duration of boiling on peanut seed composition. Journal of Agricultural and Food Chemistry 37(3); 1989; 756-760

The objective of this study was to determine the effects of boiling time and the presence of different concn. of salt during boiling on groundnut seed comp. For this purpose green peanuts (Arachis hypogaea L. cv. Florunner) were boiled in water containing various amounts of salt (0-5%) for 0-2 h to determine the effect of wet heat on seed comp.. The results showed by boiling a reduction soluble carbohydrates, soluble protein and free amino acids occured whereas there was no change in total protein, insoluble carbohydrates, and oil. The gel filtration and gel electrophoresis data showed the disappearance of major protein and polypeptide entitles which indicated that while total seed protein content is not affected during boiling the protein and polypeptide comp. are greatly altered. NGKR

81 Rodriguez (MM), Basha (SM) and Sanders (TH). Maturity and roasting of peanuts as related to precursors of roasted flavour. Journal of Agricultural and Food Chemistry 37(3); 1989; 760-765

The data on variations in total seed components due to maturity and differential response of groundnut seed of varying maturities to roasting has been presented in this paper. The defatted meals prepared from raw seeds and peanut pastes were analysed for soluble and insoluble carbohydrates alpha-amino nitrogen protein by standard procedures. The results showed that the protein and carbohydrate contents of the raw seeds and pastes were similar but the alpha-amino nitrogen content of the pastes was lower than that in the raw groundnuts. Protein and carbohydrates of the seeds of different maturities responded similarly to roasting but the alpha-amino Nitrogen decreased more (38-55%) in the mature seed than in the immature seed (25-28%). Groundnut pastes contained significantly lower amounts of the 90000, 70000, 50000 and 32000 M. W. polypeptides than the raw groundnuts. NGKR

Groundnut flour

82 Madhavi (DL), Lalitha Subramanyam, Nagin Chand and Srinivasan (KS). Effect of solvent extraction on removal of nutty flavour and functional properties of ground flour. Journal of Food Quality 11(5); 1989; 375-385

Hexane extracted groundnut flour was re-extracted with absolute ethanol, 95% isopropanol, hexane:ethanol and hexane:isopropanol ozeotropes for different time intervals. Sensory evaluation studies indicated that 6 h extraction with ethanol or isopropanol and 24 h extraction with hexane; ethanol azeotrope removed nearly 80-90% of nutty flavour. Some significant changes were observed in water obserption capacity, emulsification capacity and foaming properties of secondary solvent extracted meals. No significant changes were observed in fat obsorption capacity, protein solubility and amino acid composition of secondary extracted samples. Gel electrophoresis did not reveal any marked changes in the protein composition of the reextracted meals. AS

Groundnut proteins

83 Chiou (RY-Y) and Tsai (T-T). Characterization of peanut proteins during roasting as affected by initial moisture content. Journal of Agricultural and Food Chemistry 37(5); 1989; 1377-1381

In these studies the internal temp. changes in peanuts with various moisture contents due to roasting were monitored, N solubility of peanuts subjected to various time/temp. roasting conditions quantitatively studied and physicochemical changes in peanut proteins during roasting and cooking in a water bath were investigated with use of gradient PAGE. Dry peanut kernels were moisture conditioned and their internal temp. profiles roasted at 150 C were monitored. It was seen that the seeds containing higher initial moisture resulted in slow internal temp. increase. The initial moisture also affected denaturation of proteins as seen from the phosphate buffer extracts of proteins from splits roasted to various temp. between 80-150 C. The amount of extracted protein declined with an increase in initial moisture content from 3.2 to 23.2% when the roasting temp. was 140 C. The other PAGE analytical studies also showed that the thermal behaviour of arachins and non-arachins varied depending on the conditions of heating and initial moisture. NGKR

Rapeseeds

84 Finnigan (TJA) and Lewis (MJ). Detoxification of alkaline extract of United Kingdom commercial rapeseed meal by diafiltration. Lebensmittel-Wissenschaft und-Technologie 22(3); 1989; 116-118

Diafiltration was used for the detoxification of alkaline extract of United Kingdom commercial rapeseed meal. A plot of glucosinolate permeate concn. as a function of diavolume suggested that membrane rejection of glucosinolates had reduced the process efficiency. Glucosinolate rejection was estimated from the change in permeate concn. during diafiltration, but did not give an acceptable value. The passage of 3.53 diavolumes produced a retentate with no detectable glucosinolate, but concomitant losses of extracted solids and true protein were high. AS

85 Shahidi (F) and Gabon (JF). Individual glucosinolates in six canola varieties. Journal of Food Quality 11(6); 1989; 421-431

The glucosinolate comp. of canola var. of Altex, Candle, Regent, Tower, Triton and Westar were determined by gas chromatography (GC) and high-performance liquid chromatography (HPLC). Twelve glucosionolates were detected and their identities confirmed by comparison with the retention times of known glucosinolates and by mass spectrometry (MS). The major glucosinolates present in canola meals were gluconapin (3-butenyl), progoitrin (2-hydroxy-3-butenyl), glucobrassicanpin (4-pentenyl), glucobrassicin (3-indolylmethyl) and 4-hydroxyglucobrassicin (4-hydroxy-3-indolylmethyl). Indole glucosinolates were quantified better by HPLC than GC method of analysis. Sulphinyl glucosinolates were determined only by the HPLC methodology due to the yield of multiple peaks by GC. AS

Soybeans

86 Patel (AA) and Gupta (SK). Storage related changes in flavour and certain chemical characteristics of a soy-based spread. Food Chemistry 33(4); 1989; 311-317

This study has been carried out on the flavour acceptability and certain chemical properties of an o/w low fat spread prepared from a soy conc. and vegetable fat during storage under various conditions. Shelf stability of the spread was substantially enhanced by the use of preservatives such as benzoic acid, sorbic acid and potassium sorbate. The results revealed that at 0.1% level was more effective than 0.05% and the spread containing sorbic acid and potassium sorbate retained an acceptable flavour 10 wks at 5 C and no significant difference was noticed between glass jars and tin cans storage. There was correlation between acidity, free fatty acids and non-protein nitrogen and the flavour changes in the product during storage. NGKR

Soy proteins

87 Ross (LF) and Bhatnagar (D). Enzymatic phosphorylation of soybean proteins. Journal of Agricultural and Food Chemistry 37(4); 1989; 841-844

Soybean proteins were enzymatically phosphorylated with the catalytic subunit of cAMP-dependent protein kinase isolated from bovine cardiac muscle. Both of the major storage proteins, beta-conglycinin and glycinin, were phosphorylated. Heat denaturation of the soy proteins increased the amount of Tau- ^{32}P/ incorporation. Soy isolates incorporated up to 0.88 mol of phosphate/mol of beta-conglycinin and over 1.0 mol of phosphate/mol of glycinin. Enzymatic phosphorylation could provide a means of increasing the solubility of soy proteins at mildly acidic pH and thus extend the availability of soy proteins for use in the food system. AS

Sterculia foetida

88 Bhattacharyya (AK) and Mazumdar (BC). Nutritive value of the Sterculia foetida nuts. Science and Culture 55(6); 1989; 220

Sterculia foetida L is a tropical and subtropical tree planted along the avenues. The nuts are edible and it contains 16% protein and 37% total ether extractable lipids. The physical characteristics of the nuts are also mentioned. KAR

Sunflowers

89 Hollo (J), Peredi (J), Borodi (A) and Kovari (J). Production of special quality sunflower meal. FAT Science and Technology 91(6); 1989; 219-224

Sunflower in addition to oil contains good amounts of protein, therefore processing should be such that it should give a good quality of meal. Dehulling is carried out in dehulling drums operating on the principle of beating and/or centrifugation and separation of the hulls and kernels. To minimise loss of oil, the selected hulls are passed through a hall-cleaning device. Good amount of data is given to justify the above finding. N

Sunflower proteins

90 Bulmaga (VP), Lapteva (NA) and Vaintraub (IA). The effect of phytate on the solubility of the sunflower seed proteins. Nahrung 33(2); 1989; 161-165

11S protein of the sunflower seed is precipitated by phytate at pH 2.0, a protein-phytate complex being formed thereby. The number of the phosphate groups bound by the time the precipitation is completed is less than one half of that of the basic groups of the 11S protein. The insolubility of the complex formed interferes with the acid extraction of protein from the sunflower meal and solvent cake. The protein extractability increases sharply after the removal of the phytate. AS

91 Durante (M), Bernardi (R), Lupi (MC) and Sabelli (P). Characterization of Helianthus annuus L. storage proteins. Journal of Agricultural and Food Chemistry 37(4); 1989; 852-855

A rapid method is described for isolating the globulin fraction (helianthinin) of sunflower seeds (Helianthus annuus L.). The protein was characterized by chromatography and electrophoresis and compared with the globulin extracted from protein bodies. The native protein shows an apparent mol. wt. of 300K, but, alternatively, a 190K band is present in some selfed lines of sunflower. Electrophoresis under denaturing conditions evidences four major components with mol. wt. 39.2, 32.5, 25.6, and 23.2K, each containing two polypeptides and some minor polypeptides. In the 190K protein, the 32.9K component is absent. Isoelectric focusing indicated an heterogeneity

of subunits within a pI range of 5.0-6.2 as confirmed by two-dimensional electrophoresis. AS

TUBERS AND VEGETABLES

92 Jordy (A). Formation of ethylenechlorhydrine in vegetable products especially in Camomile after fumigation with ethyleneoxide, depending on the water content and the packaging materials. Deutsche Lebensmittel-Rundschau 85(9); 1989; 279-285 (De).

The formation of ethylenechlorhydrine (ECH) during and after the fumigation of camomile with ethyloxide (dosage 500 g EX/m^3, 6 hr) was investigated depending on the water content and the packing material. If the water content was relatively low, the ECH residue continued to rise after the fumigation; in the case of higher water contents, it usually decreased continually immediately after fumigation, irrespective of the packing material. Part of the decrease of the ECH residue is due to desorption, which was identified in N atm. ECH desorbed from camomile during the desorption period is accumulated in paper packing material; this is, however, not the case with PE film. It is remarkable that during and for a short time after fumigation the water content of camomile decrease and thereafter may rise to over 100%. In relatively dry camomile, however, the ECH content increase at first and decreases again later on. AS

Tubers

Potatoes

93 Rai (RD) and Verma (SC). Evaluation of the potato cultivars for chipping. Indian Food Packer 43(6); 1989; 15-19

Potato cv. (Solanum tuberosum) and its hybrids were evaluated for chip-making before and after cold storage by assessing the dry matter, reducing sugar contents of the tuber and colour of the fresh fried chips. The potato cv. produced chips of acceptable colour before storage. After 7 months of cold storage (2 plus or minus 1 C) all the cv. accumulated reducing sugars and produced dark brown coloured, unacceptable chips. Post-storage reconditioning of the tubers at ambient temp. (22 plus or minus 2 C) decreased the reducing sugar content and improved the chip colour, but varietal differences were also existed. 'K. Chandramukhi' and 'K. Sindhuri' var. found to be suitable for chip-making after harvest and 2 wk after post storage conditioning. KAR

Sweet potatoes

94 Ghazi (A), Abd-El-Aal (MH) and Khalil (M). Effects of frying and storage at room temperature on the chemical composition and quality of sweet potato slices. Nahrung 33(2); 1989; 153-159

Fried sweet potato slices were prepared from yellow (Mabrouka)

and orange (Abees) tubers. Some chemical and organoleptic qualities were studied. Changes in these qualities which occurred during storage for 3 months at room temp. were also investigated. The results obtained led to the following conclusions: 1. sweet potato slices had moderate amounts of Ca and P, and there was no significant differences in mineral content between fresh and fried sweet potato slices. 2. Sweet potato slices contained a fair amount of essential amino acids, especially leucin, valine and lysine, whereas tryptophan and sulphur amino acids were the limiting amino acids. 3. Sliced sweet potato of yellow var. (Mabrouka) dipped in water, then deep fried in cottonseed oil at (180 plus or minus 5) C for 1.25 min was organoleptical proved to be the best compared with those prepared from orange var. (Abees), or of yellow var. but dipped in 1% citric acid. 4. Storage of fried sweet potato slices (Mabrouka) in polyvinyl packages at room temp. led to gradual increase in their moisture content and peroxide value, while carotenoids content decreased. Furthermore, the fried sweet potato slices were acceptable until the 10th wk of storage, then a rancid taste begins to appear. AS

95 Silva (JL), Yazid (M), Ali (M) and Ammerman (GR). Effect of processing method on products made from sweet potato mash. Journal of Food Quality 11(5); 1989; 387-396

Green and cured (seven days at 29 C and 90% RH) 'Centennial' sweet potato roots were used to make and evaluate frozen and canned mashes and canned whole roots. Fried patties and pies were made from each of the processed products. The frozen mash from green roots was higher in pH while the canned mash from green and cured roots was lower in pH and higher in viscosity. The canned mash had the lowest 'L' and 'a' readings but was rated the highest in colour score when made in to pies. However, the fried patties were scored higher in colour when made from frozen mashes or canned whole roots. Moreover, pies made from low viscous mashes were scored low in texture. AS

Vegetables

96 Roy (SK). Post-harvest technology of vegetable crops in India. Indian Horticulture 33(4)-34(1); 1989; 76-77

A brief review dealing about the pre-harvest management of crops and also post harvest operations like packaging; transportation; marketing; storage; and processing of vegetable crops. KAR

97 Siddiqui (IR). Studies on vegetables. Fiber content and chemical composition of ethanol-insoluble and soluble residues. Journal of Agricultural and Food Chemistry 37(3); 1989; 647-650

This paper describes an alternative approach to fiber analysis using ethanol insoluble residues from four Canadian vegetables and also reports on the ethanol soluble lower mol. wt. carbohydrates. Four vegetables were analyzed for moisture, N, starch, lignin, ash, and uronic anhydride. These starch free residues after enzyme hydrolysis were recovered and analysed for neutral sugars following acid hydrolysis and derivitization as alditol acetates by GLC. The

results showed from the total of lignin, cellulose, and non-cellulosic polysaccharides the dietary fibre contents of celery, parsnip, rutabaga and squash to be 1.1, 4.7, 2.3 and 2.3% resp. on fresh wt. basis. The ethanol soluble residues showed major amounts of glucose, myoinositol and sucrose. The residue from celery in addition showed higher amounts of malic acid and mannitol. Whereas fructose was absent in all the residues. NGKR

Cauliflowers

98 Ramaswamy (HS) and Ranganna (S). Effect of blanching and sulphite treatment on the quality of frozen cauliflower. Journal of Food Quality 11(6); 1989; 443-452

The influence of blanching time and post-blanching sulphate treatment on the sensory quality and texture of frozen cauliflower were assessed after storage at -18 C for up to one yr. The treated cauliflower florets, sealed in polyethylene bags, were placed in waxed paperboard cartons and frozen in a contact plate freezer at -35 C. Samples blanched for 3 min and dipped in a solution containing 1000 p.p.m. of sulphur dioxide for 5 min gave a significantly ($p<0.05$) superior product even when stored for one yr. The residual sulphur dioxide content of 50 p.p.m. found in these stored samples disappeared after a 3 min cooking in boiling water. Cauliflower texture was influenced by blanching time but the textural differences of blanched samples diminished following freezing and storage. After a 3 min cooking, the texture of all thawed samples were comparable to that of fresh cauliflower cooked for 10-12 min. AS

99 Ramaswamy (HS) and Ranganna (S). Residual Peroxidase activity as influenced by blanching sulphur dioxide treatment and freezing of cauliflowers. Journal of the Science of Food and Agriculture 47(3); 1989; 376-381

The influence of blanching time and sulphur dioxide treatment on the residual peroxidase activity and its implication for the sensory quality of frozen cauliflowers were assessed after storage for up to one yr. at -18 C. The treated cauliflowers, sealed in polythene bags, were placed in waxed paperboard cartons and frozen in a contact plate freezer at -35 C. The sensory quality of frozen stored cauliflowers related well to their residual peroxidase activity, which was sensitive to the sulphur dioxide treatment. Blanched cauliflowers following a brief dip in a metabisulphite solution prior to freezing gave a significantly ($P<0.05$) superior product even when stored for one yr. The residual peroxidase activity, which ranged from 1 to 5.5% in the blanched samples, was below 1% in the sulphur dioxide treated samples, and the sulphur dioxide content of 50 p.p.m. found in these stored samples disappeared after 3 min cooking in boiling water. AS

Cucurbits

100 Samant (SK) and Rege (DV). Some enzymes and enzyme inhibitors from cucurbit seeds. Journal of the Science of Food and Agriculture 47(3);

1989; 383-385

Urase, lipase and lipoxygenase of cucurbit seeds exhibit significant trypsin- and amylase -inhibitor activities which are thermolabile. BV

Tomatoes

101 Adegoroye (AS), Jolliffe (PA) and Tung (MA). Textural characteristics of tomato fruits (Lycopersicon esculentum) affected by sunscald. Journal of the Science of Food and Agriculture 49(1); 1989; 95-102

Six textural characteristics, deformation, epicarp strength, locular resistance, firmness, compliance and toughness, were calculated from force/deformation curves obtained by punch testing tomato fruits (Lycopersicon esculentum Mill cv Vendor) in which sunscald had been induced by radiation stress. Sunscalded portions of unstored fruits had higher compliance and lower firmness values than the uninjured portions. For the stored fruits, the magnitude of the ripening-induced decrease in epicarp strength, locular resistance and firmness associated with storage was significantly reduced by 'incipient' injury and eliminated by 'advanced' injury. Preferential ripening of the uninjured portions increased deformation and toughness beyond expected values. Various sunscald symptoms such as inhibition of fruit softening, the production of tough tissues, the localisation of sunscalded tissues and the differential ripening uninjured parts relative to the sunscalded portions can be detected by determining force-deformation characteristics of the sunscalded tomato fruits. AS

102 Cantarelli (PR), Palma (ER) and Caruso (JGB). Composition and amino acid profiles of tomato seeds from canning wastes. Acta Alimentaria 18(1); 1989; 13-18

Tomato seeds from processing wastes and previously submitted to Hot and Cold Break treatments were demonstrated to be a potential source of non-conventional protein due to high lysine contents even though showing primary limitation for valine. The effect of such thermal treatments on the protein quality, chemical comp. and amino acid profiles was observed. Valine limitation; protein; fat; carbohydrates; fiber and ash contents were: 67 and 74; 33.71 and 36.77; 14.62 and 19.00; 4.76 and 5.35; 41.78 and 33.04; 2.01 and 2.14% for seeds from Hot and Cold Break treatments, resp. However due to high fiber content tomato seed meals showed to be more suitable for isolation of protein concn. AS

103 Petro-Turza (M), Szarfoldi-Szalma (I), Fuzesi-Kardos (K) and Hajdu (F). Study on taste substances of tomato. I. Analytical investigations into the sugar, organic acid and mineral contents. Acta Alimentaria 18(1); 1989; 97-106

104 Ptero-Turza (M), Szarfoldi-Szalma (I), Fuzesi-Kardos (K) and Barath (A). Study on taste substances of tomato. II. Analytical investigation into the free amino acid, peptide and protein contents. Acta

Alimentaria 18(1); 1989; 107-117

105 Shewfelt (RL), Brecht (JK), Beverly (RB) and Garner (JC). Modification of conditions at the wholesale warehouse to improve quality of fresh-market tomatoes. Journal of Food Quality 11(5); 1989; 397-409

Previous studies suggested that modification of storage temp. at the wholesale could sufficiently retard ripening to permit harvest of fresh market tomatoes at a later maturity, thus allowing for greater flavour development on the vine. Tomatoes (cvs 'Celebrity' and 'Sunny') were harvested either at the breaker or pink stages of maturity. Simulated wholesale storage was conducted by holding breaker fruit for 3 days at 12 C and pink fruit for 3 days at 5 C or 37 C. Short-term low- and high-temp. storage of pink tomatoes delayed ripening sufficiently to maintain acceptable colour and firmness during retail and consumer storage at 21 C for 7 days. Flavour characteristics of tomatoes harvested at the pink stage of maturity were not significantly superior to those of fruit harvested at the breaker stage. Thus, although ripening can be delayed in pink tomatoes during postharvest handling, delaying harvest from the breaker to the pink stage does not offer the flavour advantage to warrant a change in the handling system. AS

Tomato pulp

106 Hanewinkel-Meshkini (S) and Hackmann (W). A contriubtion to the evaluation of tomato pulp. Deutsche Lebensmittel-Rundschau 85(11); 1989; 351-353 (De).

Results indicate that 90% of the tomato pulp samples that were unobjectionable from an optical and sensorial point of view, has an alcohol content of less than 0.1 g/kg, a content of organic acids (total of L-/D-lactic acids and acetic acid) of under 3 g/kg, and a citric acid/total acid relation of over 0.9. BV

FRUITS

107 Binder (RG) and Flath (RA). Volatile components of pineapple guava. Journal of Agricultural and Food Chemistry 37(3); 1989; 734-736

The volatile compounds of pineapple guava (Feihoa sellowiana Berg) fruit were identified by GC-MS and results presented in this paper. The major compounds were found to be germacrene D, bicyclogermacrene, methyl benzoate, beta-caryophyllene (2)-3-hexenyl benzoate, liantool, humlene, and 3-octanone. Out of the 85 compounds identified 47 were not previously reported in pineapple guava. NGKR

108 Engelbrecht (J) and List (D). Physical impacts on the emission of gas during the production of fruit and vegetable juices. Flussiges Obst 56(3); 1989; 104-108 (De).

The data of this study can be used as basis for a process optimization in fruit juice production. The results have shown that

especially the preparation of the juices plays a decisive role for the total gas content of the finished product. Especially in the case of fruit flesh containing juices, a strong foam formation in the degasifier can be prevented even before the degasification by specific measurements as for example the use of degasified fruit flesh or degasified water. The residual gas content can be kept low so that no problems appear during and after the filling phase. AS

109 Farnandez Escartin (E), Castillo Ayala (A) and Saldana Lozano (J). Survival and growth of Salmonella and Shigella on sliced fresh fruit. Journal of Food Protection 52(7); 1989; 471-472, 483

The ability of five strains of enteropathogenic bacteria Shigella sonnei. S. flexneri, S. dysenteriae, Salmonella derby, and S. typhi) to survive and grow on sliced jicama, papaya, and watermelon was investigated. Fruit portions were obtained aseptically and inoculated on the surface with washed suspensions of each microorganism. The test organisms survived, and in most cases increased in numbers when inoculated fruits were stored at room temp. (25-27 C) for up to 6 h. Suspensions of papaya and watermelon in sterile distilled water supported growth of S. sonnei and S. typhi, resp. Application of lemon juice to the surface of jicama and papaya reduced the count of S. typhi somewhat, but growth resumed after several hrs. Practical recommendations are presented to control risks of contamination and subsequent growth of enteric pathogens on fruits and fruit salads during preparation and sale. AS

110 King (K), Norton (G), Mitchell (JR) and Caygill (J). In-situ pectin de-esterification of alkali-treated fruit waste materials. Journal of the Science of Food and Agriculture 49(1); 1989; 75-86

Waste peel and pulp materials from orange, lime and mango fruits were treated with sodium carbonate which increased the pH and resulted in the de-esterification of pectin in-situ. Chemical and enzymic (pectinesterase) de-esterification occurred in each of the treated fruit waste materials. A specific carbonate enhancement of pectinesterase activity which was clearly demonstrated in orange peel was found to a lesser extent in lime pulp but not at all in mango peel. During treatment of the dispersions with sodium carbonate, each of the three fruit waste materials gelled. The pectin degree of esterification of the orange and lime dispersions was below 50% (low methoxyl pectin) on gelling but the mango peel dispersions gelled at pectin degree of esterification levels above 50% although the gelation mechanism was that of a low DE pectin. The degree of esterification of the soluble pectin in the mango dispersion was, however, found to be very much lower than the overall pectin degree of esterification determined. It is suggested that in-suit pectinesterase activity is restricted to the soluble pectin mango peel whereas in the citrus residues both soluble and bound pectin are de-esterified. AS

111 Tuszynski (T). Changes in the degree of pectin demethylation during fermentation of fruit musts. Nahrung 33(2); 1989; 183-189

Musts from apples, plums, black and red currants, pears, cherries and strawberries were subjected to fermentation. In the 84th h of fermentation a definite amount of exogenous pectin was added to some samples. Based on the determined content of methanol (MeOH) and its total presence, measured after alkaline hydrolysis, the degree of pectin demethylation (DDM) was calculated. Great variations of DDM as well as initial and total content of MeOH in particular musts were found. The highest DDM was found in a cherry must (83.4%) and red currant (72.4%). The remaining musts were demethylated in the range from 20 to 65%, except depectinized samples (72-98%). All the musts of 1986 displayed higher contents of total MeOH and lower degree of final demethylations than those of 1984. It has been shown that endogenous pectin contained in musts is not fully demethylated, in spite of the fact that the solution is capable of further demethylation of exogenous pectin. AS

112 Wang (CY). Chilling injury of fruits and vegetables. Food Reviews International 5(2); 1989; 209-236

This review describes the changes in membrane lipids, permeability, proteins, carbohydrates, energy supply, respiration, ethylene production and other metabolic processes that are affected by chilling temp. Method for alleviation of chilling injury such as temp. preconditioning, intermittent warming, chemical treatments, hormonal regulation, controlled atm. storage, genetic manipulation and other methods are also discussed. 281 references. SRA

Grapefruits

113 Toyo'oka (T), Uchiyama (S) and Saito (Y). Effect of gamma-irradiation on thiol compounds in grapefruit. Journal of Agricultural and Food Chemistry 37(3); 1989; 769-775

Grapes

114 Bitteur (S), Gunata (Z), Brillouet (J-M), Bayonove (C) and Cordonnier (R). GC and HPLC of grape monoterpenyl glycosides. Journal of the Science of Food and Agriculture 47(3); 1989; 341-352

The aim of the present study was to find a method alternative to enzymic hydrolysis for the analysis of grape terpenyl glycosides. GC after trimethylsilane derivatisation, and HPLC on four different stationary trimethylsilane derivatisation, and HPLC on four different stationary phases, ie bare silica, aminopropyl-, diol- and octadecyl-bonded silicas, were in turn considered for the separation of these aroma precursors extracted from grape juice, and specific enzymic hydrolyses with highly purified glycosidases showed which were the major components. These investigations show that reversed-phase liquid chromatography is better suited for both the direct and individual analysis of these glycosides. AS

Kiwifruits

115 Stec (MGH), Hodgson (JA), MacRae (EA) and Triggs (CM). Role of fruit firmness in the sensory evaluation of kiwifruit (Actinidia deliciosa cv Hayward) Journal of the Science of Food and Agriculture 47(4); 1989; 417-433

Sensory assessment was carried out on kiwifruit (Actinidia deliciosa (A Chev) Liang et Ferguson cv Hayward) from a number of maturity and post-harvest treatments given in two seasons. The influence of fruit firmness at eating ripeness was evaluated both qualitatively and quantitatively. There was a significant relationship between fruit firmness and overall fruit acceptability across all treatments, such that soft fruit were more acceptable. There was also a trend for the texture of soft fruit to be the most acceptable within each treatment. Soluble solids concn. at eating ripeness and fruit acceptability within any one treatment were not correlated. Core firmness sometimes related to flavour intensity and acceptability. In comparison with firm fruit, soft fruit had more intense and acceptble aromas in one yr., but not in another. However, descriptors in both yrs varied in frequency of usage in relation to fruit firmness in a similar manner. When compared with firm or hard fruit, soft fruit were sweter, less tangy and described as having flavours more characteristics of ripe fruit. No correlation was found between fruit firmness and flavour acceptability. The preferred firmness at eating ripeness varied among assessors. Therefore further sensory evaluations of acceptability in kiwifruit should take this factor into account. Due to the significant effect of fruit firmness on preception of sweetness and acidity in kiwifruit, conclusions as to the relative sweetness of fruit with a different history can only be drawn if fruit of a similar firmness at eating ripeness are compared. These results indicate that the use of sensory assessment to evaluate treatment effects on kiwifruit should be approached with care and with strict control on fruit firmness at assessment. AS

Mangoes

116 Chadha (KL). Mango research in India - new developments. Indian Food Packer 43(6); 1989; 33-47

This review article besides covering the improvements and developments in cultivation and breeding of mango var. also briefly covers th development in storage and ripening of mango. 61 references. KAR

117 Sahni (CK) and Khurdiya (DS). Effect of ripening and storage temperature on the quality of mangoes nectar. Indian Food Packer 43(6); 1989; 5-11

The effect of ripening stage on the quality of mango nectar from mango var. 'Dashehari', 'Chouse', 'Neelum', 'Amarpali', fruits was studied. Mangoes were ripened at room temp. (35.9-36.9 C) and at cool chamber (23.8-27.6 C) and viscosity, acidity, ascorbic acid and

total carotenoids were estimated. Dashehari and Chousa var. after a storage for 6-9 days; Neelum and Amrapali var. after a storage for 9 days at room temp. and 12 days at cool chamber could be utilized for nectar prepared from fruits stored for longer period was noticed. Carotenoids and ascorbic acid recorded max. stability in storage under cool storage. Viscosity, pH, acidity, total soluble solids, were not influenced by storage temp. but ascorbic acid loss was more rapidl at ambient temp. Reducing sugars changed rapidly at ambient temp. Sensory quality score was least affected by storage temp. and remained above the acceptability limit. KAR

118 Sangchote (S). Relationship between the physiological state of mangoes and the incidence of anthracnose (Colletotrichum gloeosporioides Penz.). ASEAN Food Journal 4(3); 1989; 123-124

Sweet cherry

119 Drake (SR), williams (MW) and Fountain (JB). Stemless sweet cherry (Prunus avium L.). Fruit quality and consumer purchase. Journal of Food Quality 11(5); 1989; 411-416

Sweet cherry (Prunus avium L.) quality and consumer acceptance at purchase were found to be similar between stem and stemless fruit. Stemless fruit had more of the desired mahogany colour at harvest, but stem fruit displayed superior colour at point of retail sale. At simulated retail sales the colour difference between stem and stemless fruit was not evident. There was no significant difference in firmness or soluble solids content between stem or stemless fruit. Stemless fruit were more bruised than stem, but stem fruit showed more surface pitting. Practical advantages of stemless fruit included: increased efficiency at harvest, elimination of some packinghouse equipment, improved use of packing material and easier consumer packaging, and reduced damage to fruit. AS

Tangerine oranges

120 Ketsa (S). Food quality of tangerine (Citrus reticulata Blanco cv. khieo waan) with thin and thick peel. ASEAN Food Journal 4(3); 1989; 121-122

CONFECTIONERY, STARCH AND SUGAR

Confectionery

121 Schmid (H) and Chiappa (O). Cocoa roasting from the nibs to the liquor. Confectionery Production 54(12); 1988; 713-716

Some considerations are made on the techniques of roasting and treating cocoa according to the philosophies and technological principles proposed by Carle and Montanari and Lehmann. Proper crushing and good shell separation depend on: correct crushing energy for the various cocoa bean provenances or resp. for: raw, dry and roasted

beans, possibility of recycling uncrushed beans to obtain separation of shells from the nibs, optional possibilities of regulating the sanction air to separate shells, possibility of using the zig-zag separarators to improve separation of the shells from the nibs before unloading from the winnower. SYR

Chocolates

122 McEwan (JA), Colwill (JS) and Thomson (DMH). The application of two free-choice profile methods to investigate the sensory characteristics of chocolate. Journal of Sensory Studies 3(4); 1989; 271-286

This paper reports an investigation of the usual free choice profiling approach compared with the more structured repertory grid method to elicit the sensory characteristics of five chocolate samples. The method of free choice profiling is based on sensory evaluation carried out by untrained assessors. This method was compared with a more structured approach based on Kelly's reportory grid method and the generalised procrustes analysis was used to analyse configurations obtained from both methods were very similar. NGKR

Cocoa

123 Nuyken-Hamelmann (C), Biehl (B) and Meyer (B). Changes in the amount of eight acids in cocoa seeds during fermentation. Chemie Mikrobiologie Technologie der Lebensmittel 12(2); 1989; 52-57 (De).

Capillary isotachophoresis allowed to determine simultaneously eight acids (citric, oxalic, malic, tartaric, phosphoric, lactic, acetic, and glycollic acid) in various samples of fermented and unfermented cocoa seeds. Additionally changes in the amount of these acids were determined in the course of several fermentations in Malaysia. In unfermented seeds, the content of the first five mentioned acids in the seeds increases progressively with pod ripeness. Variations in the content of the acids in fermented seeds are in the same range as in unfermented seeds. They are not due to differences of provenances. During fermentation, the content of the di- and tricarboxylic acids mentioned above decreases, while phosphoric acid initially increases, due to the liberation from bound phosphate. Lactic, acetic, and glycollic acid are absorbed by the seed from the fermenting pulp during fermentation. AS

Jelly

124 Lees (R). Production of jelly confections - part one. Confectionery Production 54(12); 1988; 734, 749

The quality controlling parameters in the manufacture of gelatine jellies are briefly described, which include composition, heat treatment, presence of other components, processing conditions and conditions for storage. SYR

Starch

125 Dolan (KD), Steffe (JF) and Morgan (RG). Back extrusion and simulation of viscosity development during starch gelatinization. Journal of Food Processing and Preservation 11(2); 1989; 79-101

A generalized apriori theoretical model relating apparent viscosity of protein dough to several independent variables was used to model gelatinized starch dispersions. Independent variables in the original model were shear rate, temp. moisture content, temp.-time history and strain history. The model is applied here to corn starch dispersions gelatinized using various temp.-time treatments. Apparent viscosity of a 13.7% gelatinized corn-starch solution at constant shear rate and strain history was measured at 20 C using a back extrusion technique. Activation energy of gelatinization was estimated as 210 KJ/mol (50 Kcal/mol) over the range 81-95 C. The activation energy decreased in the range 95-105 C. AS

Sugar

Sugarcane juices

126 Kumar (S), Kumar (D) and Sinha (RM). Change in yield attributes, juice quality and mineral nutrients in cane juice due to smut infection. Indian Sugar 39(4); 1989; 233-237

Smut infected sugarcane va. CoJ 64 and B.O. 110 were analysed for chemical characteristics. Reduction in total soluble salts, and ash of juice were noted in juice extracted from smut infected var. while invertase activity, hydrogen ion concn., reducing sugars and titratable acidity were increased. The contents of P, Zn, Cu, and K were depleted in infected var. whereas Na, Ca, N, Mg, Fe and B accumulated in the juice of infected cane. KAR

BAKERY PRODUCTS

Bread

127 Benedito de Barber (C), Prieto (JA), Collar (C) and Barber (S). Isolation, purification and determination of low molecular weight peptides from bread dough. Acta Alimentaria 18(1); 1989; 53-63

Efficiency and suitability of different solvents, 1 mol^{-1} acetic acid (i), distilled water (ii) and 70% ethanol (iii), for the extraction of low mol. wt. peptide fraction from unfermented wheat flour dough are tested. Purification of dough soluble fraction (SN) was carried out following the sequence: ultrafiltration (i, ii) or absolute ethanol precipitation (iii), ion exchange chromatography on Dowex 50W-X2, mol. exclusion chromatography on Sephadex G-10 and ligand exchange chromatography on Cu^{2} + Sephadex, for each solvent tested. Low mol. wt. peptide content was estimated in each purified

extract by analysing primary amino nitrogen (AN). Results obtained show that the methodology used is suitable for the isolation and purification of low mol. wt. peptides being their estimated content, larger in the acetic acid extract, 32.6 mg per 100 g dough, d. b. (i), than in the other extracts: 24.0, mg per 100 g dough, d. b. (ii) and 26.9 mg per 100 g dough, d. b. (iii). AS

128 Lathia (DN) and Martina Koch. Comparative study of phytic acid content, in vitro protein digestibility and amino acid composition of different types of flat breads. Journal of the Science of Food and Agriculture 47(3); 1989; 353-364

Phytic acid content of eight different types of leavened and unleavened flat breads was determined. It was highest in unleavened and non-fermented whole wheat chapathi and lowest in the leavened and fermented white wheat flat bread roghni nean. The effect of baking conditions, bread comp. and phytic acid content on in vitro digestibility of protein was measured using a pepsin multienzyme pH stat technique. The amino acids released were separated byultrafiltration. The rate of protein digestibility of flat bread and amino acid released depended upon the type of flour used, baking conditions, phytic acid content and other antiproteolytic constituents of breads. Leavening and fermentation of breads resulted in an increase of protein digestibility and availability of amino acids. Addition of soy flour increases the protein digestibility of breads whereas millet flour decreases it. AS

129 Mahmound (RM) and Abou-Arab (AA). Comparison of methods to determine the extent of staling in Egyptian type breads. Food Chemistry 33(4); 1989; 281-289

This investigation was carried out to compare the different methods used for the detn. of extent of staling in Egyptian type breads. This has been done by following staling rates of the most popular wheat bread types (Balady shamy and Fino) during 48 h. Of storage periods at room temp. by loss of moisture, total water solubles, swelling power, starch intrinsic viscosity and sensory evaluation and freshness detn. It was found that the rate of staling was higher in Balady bread than that of Fino and shamy breads. When comparisons were made between different methods for staling rate of bread a correlation coeff. of 0.916 was found between organoleptic values and swelling power. As swelling power has been found to be the most simple and rapid test it has been recommended in Egypt for following staling of bread of various types. NGKR

130 Silaula (SM), Lorimer (NL), Abik (ME) and Uebersax (MA). Rheological and sensory characteristics of bread flour and whole wheat flour doughs and breads containing dry roasted air-classified pinto and navy bean high protein fraction. Cereal Chemistry 66(6); 1989; 486-490

Dry-roasted navy and pinto bean cotyledons were ground and air classified. The high-protein (40-44%) fractions were used as a substitute for bread flour and whole wheat flour in dough and bread

systems. Blends of bread or whole wheat flour/high-protein legume flour were prepared in the proportions 100:0, 90:10, 85:15, and 80:20. Water absorption, arrival, and dough development time increased while stability decreased for both bread flour and whole wheat flour farinograms. Treatments, with 10 or 20 p.p.m. potassium bromate and 0.5 or 1% sodium stearoyl-2-lactylate improved bread vol. Legume substitution tended to increase tenderness and reduce lightness of breads. Increasing levels of legume substitution significantly decreased many sensory parameters of white bread, but fewer significant differences were found for whole wheat breads. AS

Cookies

131 Pomeranz (Y), Lookhart (GL), Rubensthaler (GL) and Albers (L). Changes in gliadin proteins during cookiemaking. Cereal Chemistry 66(6); 1989; 532-534

Gliadin proteins were characterized in sugar snap cookies from eight flours representing both soft and hard wheats varying widely in protein contents and functional properties that were baked by a conventional method or steamed. The methods used for gliadin characterization included polyacrylamide gel electrophoresis and high-pressure liquid chromatography. Chromatographic peaks of highly hydrophobic gliadin proteins extracted from steamed cookies were smaller than those extracted from baked cookies; the decrease was larger in good than in poor cookies flours. The results indicated that binding (in extractability) of gliadin proteins during baking varies with end-use properties of cookie flours, type of baked product, and type and length of baking regime. AS

Pasta

132 Lichodzievskaja (IB), Braudo (EE), Chimirov (JI), Muchin (MA), Tolstoguzov (VB), Muschiolik (G) and Webers (V). Production of pasta from baking flour with addition of polysaccharides. Nahrung 33(2); 1989; 191-201 (De).

A study has been undertaken to investigate the influence of polysaccharide additives and additives of low mol. salts on the quality of pasta from baking flour and weak-wheat semolina. By addition of sodium alginate, beet pectin or methyl cellulose to the dough the stability of the dried and cooked pasta increase and the cooking loss decreases. The yellowiness of the cooked noodles can be improved by addition of potassium bicarbonate. Recipes for the addition of polysaccharides and potassium bicarbonate to the noodle dough are given and their favourable influence on the noodle quality is demonstrated. Owing to these additives the properties of the pasta are less dependent on the extrusion temp. AS

MILK AND DAIRY PRODUCTS

133 Benkerroum (N) and Sandine (WE). Inhibitory action of nisin against Listeria monocytogenes. Journal of Dairy Science 71(12); 1988; 3237-3245

The sensitivity of nine strains of Listeria to nisin was determined as well as the min. inhibitory concn. of nisin necessary to completely inhibit growth of these strains. All strains tested were variably sensitive to nisin and different MIC values were obtained, ranging from 740 to 10^5 IU/ml in trypticase soy agar and from 1.85 to 10^3 IU/ml in MRS agar. The inhibition of L. monocytogenes ATCC 7644 in TSB trypticase at different pH values and in sterilized and non-sterilized cottage cheese by nisin (37×10^2 IU/ml and 2.55×10^3 IU/g, resp.) also was investigated. This bacterium was completely inhibited after 24 h at pH 5.0 and above. At pH 4.5, 4.0, and 3.5, it was inhibited within 24 h. In cottage cheese no Listeria survivors were found at 24 h at 37 and 4 C whether or not the cheese had been sterilized when as many as 0.35×10^6 cell/g were added to zero time. AS

134 Fernandes (CF), Shahani (KM) and Amer (MA). Effect of nutrient media and bile salts on growth and antimicrobial activity of Lactobacillus acidophilus. Journal of Dairy Science 71(12); 1988; 3222-3229

The Lactobacillus acidophilus strains produced variable quantities of antimicrobial substances in three different media: Elliker's MRS (deMan, Rogosa, and Sharpe), and LBS (Lactobacillus selection) broths. The interaction between L. acidophilus strain and nutrient medium was statistically significant, indicating an influence of the nutrient medium on the level of antimicrobial activity produced. Also statistically significant different were levels of the antimicrobial activity of different strains and the pH of the medium at the end of the fermentation period. Bile salts were added to MRS broth to simulate concn. in gastrointestinal tract of humans. Antimicrobial activity as well as growth decreased in the presence of high concn. of bile salts. Sodium glycocholate was more inhibitory than sodium taurocholate at equimolar levels. Calcium hydroxide was added to MRS broth at hourly intervals for 8 h to adjust the pH of the fermentation medium to pH of 6.5, which resulted in a doubling of cell numbers. However, there were no differences in the levels of antimicrobial activity at the end of 24 h. Although there were no differences in pH of the fermentation medium at the end of 24 and 48 h, the antimicrobial activity increased after 24 h of fermentation. AS

135 Girdhari Lal) and Verma (RD). Dairy waste treatment methods. Indian Dairyman 41(9); 1989; 469-474

Dairy wastes are rich in degradable organic matter and exert a high oxygen demand. Selection of proper treatment method therefore depends upon whether the disposal is done into water course or into

public sewers or on to land for irrigation. Treatment methods described include activated sludge process, aerated lagoons, oxidation ditch, trickling filter and rotating biological discs. These have been compared with respect to biological oxygen demand, cost, land requirement and economic factors. KAR

136 Kang (Y-J) and Frank (JF). Biological aerosols. A review of airborne contamination and its measurement in dairy processing plants. Journal of Food Protection 52(7); 1989; 512-524

Processing plant air is a source of post-pasteurization contamination of dairy products. Little is known about the extent to which biological aerosols contaminate pasteurized products, however evidence indicates that air within a packaging area is a critical control point for both pathogens and spoilage microorganisms. Consequently, it is important to understand the characteristics of biological aerosols, learn how to control their occurrence, and discover practical and valid monitoring methods. Methods used for monitoring viable particles in air include the use of sedimentation plates, impingers, slit and sieve impactors, filters, and centrifugal samples. Each of these methods has limitations on its usefulness for dairy plant air monitoring. Microorganisms are often injured due to the stresses of the aerosolized state and consequently may not grow on selective media. Sampling methods such as impingement and filtration which subject the organisms to additional stress may cause sufficient injury to prevent growth on non-selective media. However, Gentler collection methods such as centrifugal samplers may not generate enough force to collect the smallest viable particles. Aerosols are generated within the dairy plant by worker activity, sink and floor drains, water spraying, and air conditioning systems. Environmental sanitation, air filtration, air flow control, and control over personnel cleanliness and activity are useful control measures. The adoption of "clean room" design principles for a packaging area will aid in controlling biological aerosols in new dairy processing plants. AS

137 Katre (BC) and Prasad (S). Minimising consumption of electrical energy in dairy processing. Indian Dairyman 41(9); 1989; 475-478

Increase in processing cost adds to the price of the final product and the electricity attributes to a sizeable operational cost of the dairy processing plant. The various points to be considered in minimising electricity consumption in a dairy factory include improving power factor by selecting the ideal equipment, mnimising running of equipment at partial load, proper scheduling of process operations and preventive maintenance. Main losses have been attributed to utility shortage, heat loss, pressure of head loss and milk reprocessing. Measures to overcome this have been indicated. KAR

Milk

138 Bauer (S), Schindler (D) and Kroll (J). Test method for the determination of aflatoxin M_1 in milk and milk products, studied for standardization. Nahrung 33(2); 1989; 217-219 (De).

139 Chandler (RE) and McMeekin (TA). Temperature function integration as the basis of an accelerated method to predict the shelf life of pasteurized, homogenized milk. Food Microbiology 6(2); 1989; 105-111

The number of psychrotrophic pseudomonads in pasteurized, homogenized milk after a specified storage time was correlated with an equivalent storage time at 4 C using a time/temp. function integrator (TTFI). This incorporated a relative rate function based on the square root model and a notional min. temp. value (T_{min}) of 263 K. A simple accelerated shelflife test using the TTFI and storage at 12 C is proposed. Practical applications for TTFI in process control and shelflife prediction are suggested. AS

140 D'Aoust (J-Y), Park (CE), Szabo (RA), Todd (ECD), Emmons (DB) and McKellar (RC). Thermal inactivation of Campylobacter species, Yersinia enterocolitica and hemorrhagic Escherichia coli 0157:H7 in fluid milk. Journal of Dairy Science 71(12); 1988; 3230-3236

Heat treatment of raw milk in an HTST pasteurizer operated at 60.0 to 72.0 C for a min. holding time of 6.2 s rapidly inactivated mixtures of hemorrhagic Escherichia coli 0157:H7, Yersinia enterocolitica and Campylobacter spp. (C. fetus, C. coli, and C. jejuni). Each of the three genera in the mixture was inoculated at a level of approx. 1.0×10^5 cfu/ml. At 60.0 C, hemorrhagic E. coli showed a max. 2 $\log_{10}$ reduction in counts and no viability at greater than or equal to 64.5_{10} C. Yersinia enterocolitica and Campylobacter spp. showed greater heat sensitivity with a 4 $\log_{10}$ reduction in counts at 60.0 C and absence of viable cells at greater than or equal to 63.0 C. These findings reiterate the need for stringent control of thermal processes in the manufacture of dairy products from raw or heat-treated (non-pasteurized) milk. AS

141 Greenwood (M) and Hooper (WL). Impoved methods for the isolation of Yersinia species from milk and foods. Food Microbiology 6(2); 1989; 99-104

Recovery of Yersinia spp. following enrichment of milk samples in tris-buffered peptone water pH 8.0 (TPW) incubated at 9 C was compared with recovery from buffered peptone water pH 7.2 (BPW) incubated at 4 C. The number of isolations obtained from TPW/9 C was approx. twice the number obtained from BPW/4 C. Weekly subculture to Cefsulodin Irgasan-Novobiocin (CIN) agar for three wks was found to achieve greatest recovery of Yersinia, but this might be replaced by a single subculture after 11-14 days, enrichement with little loss of recovery. When enrichment of milk and food samples in TPW incubated at 9 C was followed by post enrichement alkali treatment, the detection of Yersinia sp. was again improved, particularly from food samples. A regime of enrichment at 9 C in TPW followed by post-enrichement alkali treatment immediately before subculture to CIN agar is recommended for the recovery of Yersinia spp. from milk and foods. AS

142 Harwalker (VR), Boutin-Muma (B), Cholette (H), McKellar (RC), Emmons (DB) and Klassen (G). Isolation and partial purification of astrin-

gent compounds from ultra-high temperature sterilised milk. Journal of Dairy Research 56(3); 1989; 367-373

Astringent off-flavours were observed in commercial samples of UHT-milk heated by direct-steam injection. The off-flavour components from these milk samples were isolated by the chloroform-methanol extraction procedure of Harwalkar & Elliott. The astringent-tasting components in these extracts were partly purified by isoelectric precipitation at pH 7.0 and by size exclusion chromatography on Sephadex G-50 columns. The extracted off-flavour components and the partly purified samples were further analysed by FPLC using a Mono-Q anion exchange column and PAGE. The FPLC and PAGE patterns of the extracts from astringent and non-astringent samples of milk showed marked differences and the astringent flavour correlated with one of the fractions resolved by FPLC. This fraction was found to be heterogeneous by PAGE. The astringent off-flavour in UHT-sterilized milk were Gamma-casein-like breakdown products of casein. AS

143 Marshall (RT), Wijeratne (SA) and Jesse (SD). Abnormal freezing of milk caused by ice-nucleating bacteria. Journal of Food Protection 52(7); 1989; 496-497, 502

Cultures of ice nucleating bacteria isolated from raw producer bulk milk were gram negative rods, mostly Pseudomonas fluorescens. Milk samples from which the cultures were isolated prefroze during supercooling in the cryoscopic test of freezing point. Grown under conditions of restricted nutrition, cells transferred to normally freezing samples imparted the ice nucleating factor. AS

144 Misra (AK) and Kulla (RK). Bacteriological quality of market milk. Indian Dairyman 41(9); 1989; 487-491

Various groups of bacteria present and the quality of milk produced and distributed in Calcutta (India) and its suburbs have been assessed by collecting and analysing 125 samples of raw milk and 25 samples of pasteurized milk from organised dairy farms, vendors, sweetmeat shops and dairy plants. The bacterial number were in the range of 20×10^3 to 19×10^6 /ml. Plate counts were highest in milk from sweetmeat shops (9×10^5 to 19×10^6 /ml) and the city vendors (62.5×10^4 to 17×10^6 /ml). The average coliform counts were 6.74×10^3 /ml and 6.5×10^3 /ml for milk from sweetmeat shops and vendors resp. Total plate counts in milk from organised dairy farms were 96×10^3 to 25×10^5 /ml and 27×10^1 to 90×10^2 /ml of coliforms. The total counts in pasteurised milk from dairy plants ranged between 20×10^3 and 103×10^3 /ml and only 40% of the samples were within the prescribed standards. The psychrophillic, thermoduric and thermophillic counts ranged from 20×10^2 to 30×10^5 /ml, 45×10 to 60×10^3 /ml and 3×10^1 to 91×10^2 /ml, resp. Of the total 150 samples collected 11.3% could be categorised as good milk, 37.3% fair milk, 36.7% poor milk and 14.7% very poor milk. KAR

145 Pierre (A). Milk stability in ethanolic solutions. Journal of Dairy Research 56(3); 1989; 521-527

Milk stability in ethanolic solutions depends on many factors. Mechanism of destabilization remains incompletely characterized particularly the role of milk pH is not wholly understood. The role of pH in the destabilization of milk and sodium caseinate solution by ethanol was investigated. Ethanol shifted the pH of min. stability of both caseinate and milk to higher values. A linear relation between this pH and the reciprocal dielectric constant of the mixture was observed. The addition of Ca to these alcoholic mixtures also increased the pH of min. stability. Milk is aqueous solution behaved as a caseinate, when pH was decreased, ionization of serine phosphate was reduced and that all of the micellar Ca was released from the protein before isoelectric precipitation. In ethanolic solutions, when pH decreased, ionization of serine phosphate was also reduced but Ca was not released from casein and the isoelectric point was reached at a higher pH. Ca could not be released because the solubility product of Ca (phosphate was very low in ethanolic solutions and consequently did not allow solubilization. These variations in casein charge will induce changes in protein hydration affecting protein conformation and micellar size. MCV

146 Pouliot (Y), Boulet (M) and Paquin (P). Experiments on the heat-induced salt balance changes in cow's milk. Journal of Dairy Research 56(3); 1989; 513-519

The heat-induced changes in salt balance between the colloidal phase of milk and its serum were studied using an ultrafiltration technique. Milk permeate was isolated at the heating temp. by means of a hollow fibre ultrafiltration cartridge coupled with a stainless steel heat exchanger unit. The milk samples initially at 4 C were heated to 20, 40, 60, 80 or 90 C. Ca, P, Mg and citrate contents of the permeates were determined. The decreases in Ca and P were proportional to the increase in temp. Smaller losses in Mg and citrate were observed. An initial sharp decrease in concn. occurred within the first seconds of holding time and was followed by a slower and smaller decrease. The possible occurrence of a two-stage mechanism for the heat-induced salt precipitation is discussed. The precipitation of dicalcium phosphate is believed to occur together with some tricalcium citrate precipitation. AS

Milk powder

147 Tuohy (JJ) and Kelly (PM). Effect of direct gas-fired heating on the oxidative stability of whole milk powder. Israel Journal of Technology 13(1); 1989; 33-41

Direct heating of the drying air, by direct firing with liquid petroleum gas (LPG) and natural gas, was compared with indirect heating for the manufacture of whole milk powder on a pilot-scale spray drier. Direct firing with LPG and natural gas resulted in TBA values of 0.037-0.054 (abs. units 530 nm) after manufacture compared with values of 0.016-0.018 for control (indirectly heated) powders when a conventional gas burner was used. With an excess in air type burner no significant difference in TBA value was found after manufacture or

after 31 and 58 wks storage at 37 C. AS

Milk products

Cheese

148 Anprung (P), Chuengsaengsatityaporn (S) and Thunpithayakul (C). Immobilized rennin for cheese making I. Preparation and enzymic properties of rennin immobilized and sand. ASEAN Food Journal 4(3); 1989; 107-110

This study reports parameters relative to the immobilization, pH and temp. profiles, kinetic properties, half life, leaching of immobilised rennin, electron, micrograph of renin fixed to sand and storage stability of immobilised rennin. SRA

Blue cheese

149 Papageorgiou (DK) and Marth (EH). Fate of Listeria monocytogenes during the manufacture and ripening of blue cheese. Journal of Food Protection 52(7); 1989; 459-465

Mozzarella cheese

150 Hashisaka (AE), Weagant (SD) and Dong (FM). Survival of Listeria monocytogenes in Mozzarella cheese and ice cream exposed to gamma irradiation. Journal of Food Protection 52(7); 1989; 470-492

The survival of Listeria monocytogenes preinoculated into ice cream and Mozzarella cheese prior to gamma-irradiation treatment was determined. Samples were maintained at -78 C and exposed to targeted doses of 2, 4, 8, 16 and 32 kGy of gamma-irradiation. The calculated D_{10} values were 1.4 kGy for Mozzarella cheese and 2.0 kGy for ice cream. The effective level of irradiation (12D) for inactivating L. monocytogenes was 16.8 kGy for Mozzarella cheese and 24.4 kGy for ice cream. AS

Kishk

151 Jandal (JM). Kishk as fermented dairy product. Indian Dairyman 41(9); 1989; 479-481

Kishk is a milk based fermented food of Egypt, Lebanon, Syria and Iraq, prepared from the butter milk and wheat mixture. Author describes its manufacturing method and its chemical constituents including total solids (92.05-92.60), total N (2.1%), protein (13.43-23.05%) digestion (90%), biological value (66%), salt (4.81%), vitamins, acidity, amino acid content and bacteriological characteristics. KAR

Whey

152 Roehl (D) and Jelen (P). Surface tension of whey and whey derivatives. Journal of Dairy Science 71(12); 1988; 3167-3172

The surface tension of various whole wheys, solutions of component whey proteins, UF fractions, and the effect of heating on the surface tensions of these solutions were determined using the Wilhemy plate method. The mean surface tension of three commercial cottage cheese wheys, a commercial cheddar cheese whey, and a lab. rennet whey was found to be 41.7 plus or minus 1.2 dyne/cm (25 C) and did not vary significantly with the type of whey despite differences in both pH and protein content. The surface tensions of aqueous solutions of individual pure protein fractions of whey (serum albumin, beta-lactoglobulin, alpha-lactalbumin, and gamma-globulins), in concn. approx. normal whey contents, were significantly different and greater than for the whole wheys. Heating of individual protein solutions at 80 C for 50 min produced insignificant changes in measured surface tension despite producing protein precipitation in some of the solutions. Similar heating of the whole whey solutions resulted in a significant decrease in surface tension and marked precipitation in most cases. The fractionation of the wheys into UF permeates and retentates resulted in a retentate fraction of significantly lower surface tension than for UF permeates. Heating increased the surface tension of retentate fractions while the permeate fractions showed a decrease. AS

Yoghurts

153 Foley (J) and Mulcahy (AJ). Hydrocolloid stabilisation and heat treatment for prolonging shelf life of drinking yoghurt and cultured buttermilk. Israel Journal of Technology 13(1); 1989; 43-50

Genu pectin was more effective than proplylene glycol alginate and carboxymethyl cellulose in preventing heat-induced serum separation in yoghurt and in cultured buttermilk. Serum separation decreased with increase in stabiliser concn. up to about 20% expressed as a percentage of the milk protein. Increases in storage temp. and time led to increased serum separation. The presence of 2.3% fat reduced separation. A shelf life of over 20 wks was achievable with heat-treated pectin-stabilised yoghurt and buttermilk. The viscosity values of these products increased with increase in the level of stabiliser and decreased during storage. AS

154 Lee (H), Friend (BA) and Shahani (KM). Factors affecting the protein quality of yoghurt and acidophilus milk. Journal of Dairy Science 71(12); 1988; 3203-3213

The apparent protein digestibility in vivo, the protein digestibility in vitro, the net protein ratio, and computed protein efficiency ratio were used to assess the protein quality of yoghurt and acidophilus milk as affected by heat treatment, direct acidification, addition of culture, or fermentation. Rats fed diets

containing either heated mix or yoghurt tended to eat more and gain more wt. than rats fed diets containing either unheated mix or the acidified yoghurt. Feed efficiency was also significantly higher for rats fed heated mix and yoghurt. The apparent protein digestibility in vivo was significantly higher in yoghurt diet than in the unheated yoghurt diet was significantly higher than that of either the unheated mix or the acidified yoghurt but not significantly different from the heated mix. The computed protein efficiency ratio values were also increased with both heating and fermentation The direct acidified yoghurt had a significantly lower net protein ratio and lower computed protein ratio and lower computed protein efficiency ratio than the fermented yoghurt. Rats fed either sweet acidophilus (unfermented) or acidophilus milk exhibited a significantly higher protein digestibility than rats fed heated milk. AS

155 Tomar (SK) and Prasad (DN). Therapeutic value of yoghurt - an assessment. Indian Dairyman 41(9); 1989; 483-485

The information available on the health aspects of yoghurt - a fermented milk product prepared and consumed traditionally in Balkan States - have been collected which indicate that there is need for conducting controlled and well documented studies to support the therapeutic properties of yoghurt. The aspects covered in the article include yoghurt and its influence on gastrointestinal disorders, hypocholesterolaemic effect, antitumor effect and other therapeutic uses. KAR

Milk proteins

Casein

156 Dickinson (E). Surface and emulsifying properties of caseins. Journal of Dairy Research 56(3); 1989; 471-477

This paper describes some recent research directed towards understanding the surface chemistry of casein films adsorbed at the oil-water interface. The properties of adsorbed films of alpha$_{s1}$ -, beta- and K-casein and sodium caseinate are compared at the planar oil-water interface, at the surface of emulsion droplets and at the surface of polystyrene latex particles. The paper discusses in detail the (i) relationship between the mole. characteristics of the caseins and their surface activities and surface viscosities at the oil-water interface, (ii) the nature of competitive adsorption between the caseins (particularly alpha-$_{s1}$ and beta-) and (iii) the effect of Na and Ca ion concn. on electrophoretic mobilities and flocculation behaviour. MCV

157 Lorient (D), Closs (B) and Courthaudon (JL). Surface properties of the bovine casein components. Relationships between structure and foaming properties. Journal of Dairy Research 56(3); 1989; 495-502

In order to optimize the use of casein as surfactants, the sur-

face tension, foaming capacity and stability were measured as a function of pH, ionic strength, protein concn. and polarity (modified by covalent binding of carbohydrates). The caseins differ in their behaviour at the air/water interface with beta-casein showing the greatest ability to decrease surface tension and to produce foams, due probably to its amphipathic structure. In exp. carried out at pH values close to pI, with low ionic strength and constant solubility (optimal conditions for foam formation), A high surface hydrophobicity, a good accessibility and flexibility of peptidie side chains (evalauted by proteolysis), and a high foaming capacity paralled by increased surface pressure has been observed. Foam stability of caseins was low compared to those of globular proteins such as beta-lactoglobulin. AS

158 Meisel (H) and Frister (H). Chemical characterisation of bioactive peptides from in vitro digests of casein. Journal of Dairy Research 56(3); 1989; 343-349

Bioactive peptides have been identified as digestion products of several food proteins. Milk protein is a rich source of biologically active peptides such as casmorphines (CSM) and caseinophosphopeptides (CSP) having nutritional implications. The in vivo formation of biologically active caseinopeptides during intestinal digestion of bovine casein was studied. It was proved that bioactive peptides were released in the small intestine of minipigs in the course of luminal digestion of diets containing bovine casein. An opioid peptide and a phosphopeptide were isolated from jejunal chyme and were chemically characterised. The opioid peptide was identified as a fragment of beta-casein (60-70). This peptide, named beta-casomorphin-11, displayed substantial opioid activity in an opiate receptor-binding assay. The CSP has been shown to be a fragment of alpha S_1 -casein (66-74). CSPs are likely to enhance the rate of passive Ca absorption from the distal small intestine lumen by increasing the concn. of soluble Ca. CSPs can also from organophosphate salts with trace elements such as Fe, Zn and Cu and have applications as dietary supplements and as medicines. MCV

159 Vegarud (GE) and Langsrud (T). The level of bitterness and solubility of hydrolysates produced by controlled proteolysis of caseins. Journal of Dairy Research 56(3); 1989; 375-379

Protein hydrolysates are produced for distinctly different purposes such as their functional properties and production of small peptides and amino acids used in dietetic foods and flavouring agents. A series of hydrolysates from commercial sodium caseinate and rennet casein were prepared using different commercial proteolytic enzyme preparation. Corolase PS (powder preparation of fungal proteinase form Aspergillus sp.), Corolase L 10 (liquid papain protease from papaya), Maxatase LS 400.000 (proteinase from Bacillus licheniformis and NOVOZYM 257 (proteinase from B. subtilis). Increasing degree of hydrolysis, DH, resulted in markedly changed solubility of the products. The level of bitterness varied with the enzyme used. Non-bitter hydrolysates of sodium caseinate were obtained with a DH 10-12 and protein solubilities of 99%. The rennet

casein hydrolysates exhibited low levels of bitterness and high solubility (90%), even at high DH values (DH = 55). Limited hydrolysis to a preselected DH can give products with high solubilities and no(or little) development of bitter taste, depending on the enzymes used. MCV

MEAT AND POULTRY

Meat

160 Moughan (PJ), Schrama (J), Skilton (GA) and Smith (WC). In-vitro determination of nitrogen digestibility and lysine availability in meat and bone meals and comparison with in-vivo ideal digestibility estimates. Journal of the Science of Food and Agriculture 47(3); 1989; 281-292

161 Rogov (IA), Tokacv (ES) and Kovalev (JL). New approaches to raw meat processing as a result of recent studies of food exotrophia. Nahrung 33(2); 1989; 119-131

The general supermacy of classical theory of balanced nutrition entailed the tendency to remove ballast substances from food products. However, a new theory of adequate nutrition grounded significant role of these substances in human ration. On the basis of experimental observations and theoretical theses of a new theory it was determined that animal connective tissue elements can be considered as ballast substances, that are physiologically useful for human organism. Proceeding from this a conclusion was made that a definite content of connective tissue in meat products does not reduce, but raises their nutritional value. A new level of knowledge made it possible to propose the modified method of integral score for food products nutritional value estimation. AS

162 Stanker (LH), Bigbee (C), Emon (JV), Watkins (B), Jensen (RJ), Morris (C) and Vanderlaan (M). An immunoassay for pyrethroids. Detection of permethrin in meat. Journal of Agricultural and Food Chemistry 37(3); 1989; 834-839

The development of several monoclonal antipyrethroid antibodies and an immunoassay for detection of permethrin in meat has been discussed in this paper. Synthetic pyrethroids are important class of insecticides which are widely used in modern agriculture and their analysis was found to be difficult due to their thermal instability and photoinstability. The three monoclonal anti-pyrethroid antibodies differentially recognize a range of synthetic pyrethroids, preferring phenothrin, permethrin cypermethrin and deltamethrin. One of these antibodies referred as py-1 has been used for this immunoassay for permethrin in meats. This assay was sensitive in the range of 50-500 p.p.b. permethrin in ground beef and so is found to be sensitive to detect permethrin when found to be in excess of permitted limit of 150 p.p.b. NGKR

163 Townsend (MA), Gupta (S) and Pitts (WH). Optimal roasting. Journal of Food Processing and Preservation 11(2); 1989; 117-145

In this article the application of numerical optimization techniques to the process of roasting meat under a var. of conditions of temp. was discussed and reviewed. It covers description of model; optimization; variables in the roasting process; optimization procedure and development details; modified objective functions and conclusions. NGKR

164 Townsend (WE) and Blankenship (LC). Methods for detecting processing temperatures of previously cooked meat and poultry products. Journal of Food Protection 52(2); 1989; 128-135

The review presents information relating to current procedures used by Food Safety Inspections Service (FSIS) for maintaining the adequacy of heat treatment of meat and poultry products and current research activities aimed at developing new and/or improved methods for determining max. internal temp. (MIT) of meat and poultry products. CTD

Beef

165 Boggs (DL), White (FD), Reagan (JO) and Smith (TL). Effect of tallow supplementation on beef longissimus fatty acid distribution. Journal of Food Quality 11(5); 1989; 357-364

166 Medeiros (LC), Field (RA), Menkhaus (DJ), Riley (MI) and Russell (WC). Effect of electrical stimulation and blade tenderization on palatability of beef longissimus and semimembranosus muscles. Journal of Food Quality 11(6); 1989; 487-495

The effect of electrical stimulation (ES) and/or blade tenderization (BT) on palatability of longissimus (LD) and semimembranosus (SM) muscles from ranges grazed and conc.-fed steers were compared. Range-grazed steers graded lower and the steaks contained less fat and more moisture ($P<0.05$) than those from conc.-fed steers. Broiled steaks from the range-grazed steers were less flavourful, less juicy, and less desirable overall than those from conc.-fed steers ($P<0.05$). Nevertheless, tenderness of ES and BT treated steaks from range-gazed steers was comparable to steaks from conc.-fed animals that had not been tenderized. Flavour and juiciness of LD muscle did not change with ES or BT treatments were used. AS

167 Penfield (MP), Costello (CA), McNeil (MA) and James Riemann (M). Effects of fat level and cooking methods on physical and sensory characteristics of restructured beef steaks. Journal of Food Quality 11(5); 1989; 349-356

168 Seideman (SC), Cross (HR) and Crouse (JD). Carcass characteristics, sensory properties and mineral content of meat from bulls and steers. Journal of Food Quality 11(6); 1989; 497-507

Thirty-three bulls and 22 steers were slaughtered and subse-

quent carcasses were evaluated for carcass characteristics. Longissimus muscle samples were analysed for sensory properties and concn. of Cu, Fe and Zn. Bulls produced carcasses with older maturity characteristics, larger ribeyes, less fat and produced longissimus steaks that were less tender and had more organoleptically detectable connective tissue than steaks from steers. Zn concn. was significantly correlated to skeletal maturity, fat thickness, ribeye area, conective tissue and tenderness before adjusting for sex. After adjusting for sex, mineral content did not significantly correlate as well with many carcass or sensory properties as before adjusting for sex. AS

169 Tarrant (PV). Animal behaviour and environment in the dark-cutting condition in beef. A review. Israel Journal of Technology 13(1); 1989; 1-21

Review. 49 references. BV

170 Walls (I) and Sheridan (JJ). A rapid method of enumerating microorganisms from beef, using an acridine orange direct-count technique. Israel Journal of Technology 13(1); 1989; 23-31

Pork

171 Ayob (MK), Ragab (AA), Allen (JC), Farag (RS) and Smith (CH). An improved rapid, ELISE technique for detection of pork in meat products. Journal of the Science of Food and Agriculture 49(1); 1989; 103-116

172 Jeremiah (LE) and Jones (SDM). The effects of spray chilling and vacuum packaged storage on purge losses and the retail properties of pork. Journal of Food Protection 52(7); 1989; 473-476

Products

Bacon

173 Sen (NP), Seaman (SW), Baddoo (PA) and Weber (D). Determination and occurrence of 2-(hydroxymethyl)-N-nitrosothiazolidine in fried bacon and other cured meat products. Journal of Agricultural and Food Chemistry 37(3); 1989; 717-721

A sensitive method for the detn. of 2-(hydroxymethyl)-N-nitrosothiazolidine (HMNThZ), a non-volatile N-nitroso compound, in fried bacon and miscellaneous cured meats has been developed. The method consists of extraction of the sample with acetonitrile/glacial acetic acid (100:1) in the presence of fats and lipids by liquid-liquid partitioning with isooctane, cleanup on basic alumina containing 6% water, and analysis of the cleaned-up extract by high-performance liquid chromatography-thermal energy analyzer (HPLC-TEA). The detection limit of the method is about 1-2 p.p.b. Recoveries of HMNThZ added to fried bacon at 20-50 p.p.b. levels ranged between 80 and 95%. Of various samples analyzed, 12/16 fried bacon (mean, 5.3 p.p.b; range, negative to 13 p.p.b.), 0/7 raw bacon, and

1/9 miscellaneous cured meats (a smoked ham, 2.8 p.p.b.) gave positive results. Confirmation was done by gas-liquid chromatography-thermal energy analyzer (GLC-TEA) analysis after trimethylsilylation, and also by GLC-TEA, HPLC-TEA, and GLC-mass spectrometric analyses after derivation of HMNThZ to its O-methyl ether. AS

Frankfurters

174 Bechtel (PJ), Oreskovich (DC), Mckeith (FK), Martin (SE) and Novakofski (J). Properties of frankfurters processed with potassium and sodium bicarbonate. Journal of Food Quality 11(6); 1989; 475-485

A study was designed to evaluate the use of low levels of sodium (0.25, 0.5, 1%) and potassium(0.25, 0.5%) bicarbonate on the sensory, microbial and functional properties of frankfurters. Both sodium and potassium bicarbonate resulted in higher pH values than control (no bicarbonate) on day 0 but differences diminished after storage at 4 C for 22 days. At the 0.5% level of addition, both sodium and potassium bicarbonate treatments had lower percent free water when compared to controls. The addition of high levels of bicarbonate resulted in diminished sensory properties; however, low levels had sensory characteristics in the acceptable range. No differences were detected between treatments for aerobic plate counts, anaerobic plate counts or yeast and mold counts. Results indicate on acceptable product can be produced using low levels of either sodium or potassium bicarbonate. The use of low levels of bicarbonate also results in benefical changes of some physical properties. AS

Ham

175 Cassiday (PK), Brackett (RE) and Beuchat (LR). Evaluation of ten selective direct plating media for enumeration of Listeria monocytogenes in hams and oysters. Food Microbiology 6(2); 1989; 113-125

The suitability of ten direct plating media for isolating and enumerating four strains of uninjured and injured Listeria monocytogenes from dry and country-cured hams, and raw oysters was evaluated. Five different lots of each food were inoculated with approx. 10^{2}, 10^{4} or 10^{5} -10^{6} viable L. monocytogenes cells g^{-1}. Populations of the organism were determined by surface plating appropriate dilutions onto the test media. Inoculated media were incubated at 30 C for 48 h before L. monocytogenes colonies were counted and confirmed. LiCl Phenylethanol Moxalactam Agar (LPMA) was selected as the most suitable medium for isolating and enumerating L. monocytogenes from both types of ham, while Dominguez Rodriguez Isolation Agar (DRIA) was selected as most suitable for raw oysters. Selection of the most suitable media was based on relative recovery of viable cells as well as ease of recognizing and counting L. monocytogenes colonies. AS

Poultry

176 Izat (AL), Colberg (M), Driggers (CD) and Thomas (RA). Effects of sampling method and feed withdrawal period of recovery of microorgan-

isms from poultry carcas es. Journal of Food Protection 52(7); 1989; 480-483

Five trials were conducted to evaluate the effects of four microbiological sampling techniques for determining aerobic plate counts, presumptive coliform counts, and yeasts and mold counts of broiler carcasses. The effects of feed withdrawal period on bacterial numbers was also evaluated. Sampling methods evaluated were a surface swab technique, a whole carcass rinse procedure, a breast skin rinse procedure in which the skin was excised from the breast area, and a sample blending technique that involved breast skin excision and blending. Results from thes trials indicated that the whole carcass rinse procedure yielded significantly greater recovery of aerobic mesophiles than the other methods evaluated. The recovery of coliforms was significantly greater when either the whole carcass rinse or the breast blend procedure was employed. The numbers of yeasts and molds present on the prechill carcass were extremely low, and results obtained using the various sampling methods were inconsistent. Regardless of sampling methodology and type of organism enumerated, the highest counts were obtained from broilers that had not been withdrawn from feed prior to processing. AS

177 Richter (G), Gruhn (K), Ochrimenko (C), Meixher (B) and Hennig (A). Composition and qualitative carcass characteristics of various poultry species. Nahrung 33(2); 1989; 133-144 (De).

For the broilers, hens fattening turkeys, geese, ducks and muscovy ducks produced at present in the GDR comp. and quality of the carcasses were analysed. The 20 wks old male turkeys had the highest carcass yield (81%) followed by the broilers and the 6 months old geese with 73%. For the hens and the young fattening geese was found a carcass yield of only 66%. The percentage of gizzard, heart and liver differed between 2.9% (turkeys) and 8.0% of the body wt. (young fattening geese), the percentage of abdominal fat varied from 0.5% for the turkeys to 4.7% for the 6 month old geese. The turkeys had the highest and the Peking ducks the lowest meat yield with 67-70% and 45% of eviscerated carcass. The meat was divided into breast and leg meat. The edible portion of the eviscerated carcass contained between 28% (turkeys) and 47% (Peking ducks and 6 month old geese) dry matter. The crude protein, crude fat, and ash contents varied from 15% to 20% from 7% to 32% and from 0.8% to 1.0%, resp. For the breast and leg meat, parameters of the meat quality as pH-value, colour, cooking loss, drip loss, water binding capacity and loosely bound water were determined. AS

Chickens

178 Angel (S), Weinberg (ZG) and Jaffe (R). Salt content of kosher chicken parts studied under controlled conditions. Journal of Food Quality 11(5); 1989; 365-373

Salt content in the breast, thigh and skin was determined in chickens which had been kosher-processed with different salting times, quantities and different numbers of rinses and after cooking.

Significant differences in the salt content were obtained after 1.5 h of salting. Salt quantity significantly affected only the thigh and skin. Rinsings had no effect in reducing salt content in the breast and thigh. Cooking did not reduce the salt content of the chicken except in the skin. The salt treatment used in this study, which were similar to those used in commercial kosher dressing plants, did not increase uptake of water. AS

Poultry products

Eggs

179 Roudaut (B). Residues of aminoglycoside antibiotics in eggs after medication of laying hens. British Poultry Science e 30(2); 1989; 265-271

In this study the transfer of aminoglycoside antibiotics like dihydrostreptomycin (DHS), neomycin and spectinomycin into eggs was determined separately from albumen, yolk or whole egg after their oral administration and after an intramuscular injection of DHS. Residues were then assayed by an agar plate diffusion method in cylinders with a specific test organism for each antibiotic. Results showed that in case of DHS only given by intramuscular injection left residues by the total amount of DHS excreted via the eggs to the extent of 1% of the dose administred. The residues in the eggs were detected for a period of 8 days. NGKR

180 Scott Bayer (R) and Jensen (LS). Over estimation of the cholesterol content of eggs. Journal of Agricultural and Food Chemistry 37(4); 1989; 917-920

In this paper the results of studies to evaluate the cholesterol content of eggs by the use of HPLC method and comparison with colorimetric method are presented. The results showed a cholesterol content of 10.97 mg/g of wet yolk compared to 13.86 mg/g of wet yolk as determined by colorimetric method on saponified yolk extracts. Recoveries of added cholesterol to yolk samples was almost quantitative and 17.5% of the chromogens present in the colorimetric method were in the noncholesterol fraction. It is indicated that prepurification of the cholesterol fraction from interfering chromogens is found necessary before detection by colorimetric method. NGKR

Eggs products

181 Ellison (A), Dodd (CER) and Waites (WM). Use of plasmid profiles to differentiate between strains of Bacillus cereus. Food Microbiology 6(2); 1989; 93-98

Bacillus cereus was isolated from raw and pasteurized liquid whole egg and from omelettes and retailed food which included liquid whole egg as an ingredient. Of 101 isolates, 93 contained plasmids which varied in size from 2.2 to 43 MDa and gave 10 distinct profiles. In 37 strains isolated from raw egg, 10 profiles were found in the 30 strains in which plasmids were detected. However, in 15

strains isolated after pasteurization only 2 profiles were detected, both of which were present as minor profiles before pasteurization. These proflies also formed 70% of those found in strains from omelettes manufactured at the egg pasteurization plant. Neither profile was present in 40 strains isolated from the retailed foods. Two of four food poisoning strains examined contained plasmids, one of which had a profile similar to that of a strain isolated from the raw egg. The results suggest that plasmid profiling provides a simple and rapid method for determining the source of B. cereus contamination in retail foods. AS

SEAFOODS

Fish

182 Miller (EL), Juritz (JM), Barlow (SM) and Wessels (JPH). Accuracy of amino acid analysis of fish meal by ion-exchange and gas chromatography. Journal of the Science of Food and Agriculture 47(3); 1989; 239-310

Variations in amino acid content of fish meals can be due to differences between meals or to analytical shortcomings. The purpose of the cooperative study reported here was to compare the accuracy of the ion-exchange (IE) and gas chromatography (GC) methods when applied to fish meal. The between-lab. and within-lab. variations were determined by analysing hidden duplicates of eight meals in four lab. using IE and in a further three lab. using GC. The work exposed certain pitfalls and inconsistencies in replicating results. A major source of variation in the IE method was identified as the instability of the ninhydrin reagent leading to the consequent variation in the colour yield of some amino acids which was not compensated by the use of norleucine as an internal standard. Significant between-lab. variations and fish meal x lab. interactions for certain amino acids existed. The work confirmed a need for replicate analysis of samples, whether done by IE or GC. Withour discarding any outlying values, coeff. of variation for repeatability (within-lab. variation) varied from 3.5 to 9.7% for IE and 3.5 to 8.4% (histidine at 20%) for GC. Coeff. of variation for reproducibility (between-lab variation) varied from 4.1 to 14.4% for IE and 4.5 to 11.9% (20% for histidine) for GC. The values for lysine reproducibility were 10.8% and 4.8% for methionine were 13.6% and 8.2% resp. for IE and GC. Neither of the methods was clearly superior for determining the amino acid content of fish meals. It would appear, however that the GC method tended to result in lower with-lab. variance, with arginine and histidine as exceptions. An amino acid mixture, a centrally prepared hydrolysate and a protein of known composition were also studied. AS

183 Tsai (S-F), Wang (J-H) and Jiang (S-T). Stability of muscle proteins from some subtropic fish. Journal of Agricultural and Food Chemistry 37(3); 1989; 749-752

The stability of actomyosin (AM) from some subtropic fish,

tilapia hybrid (Tilapia nilotica x Tilapia aurea), tilapia (Tilapia mossambica), carp (Cyprimus carpio), and milkfish (Chanos chanos) was investigated. According to the inactivation rate constant (K_D) of AM Ca-ATPase at 0 to 45 and -10 to -40 C, the stabilities of tilapia hybrid and tilapia AMs were higher than those of milkfish and carp AMs. All AMs of these sp. were stable at pH 6.5-7.9 and had two max. CA-ATPase activities at pH 5.8-6.1 and 9.2, which were lower than other sp. inhabiting cold areas. No significant differences in K_D values among these sp. was observed when stored at -40 C for 6 months. The tilapia hybrid and tilapia were the most stable at storage temp. of -10, -20, and -30 C. AS

Herrings

184 Fichtl (P) and Schreiber (W). Curing herring fillets by means of starter bacteria. Chemie Mikrobiologie Technologie der Lebensmittel 12(2); 1989; 33-38 (De).

From genuine matje fillets a series of bacteria have been isolated, which belongs to the genus Vibrio, most of them contained cytochromoxidase. These bacteria were used for inoculating herring fillets, in the presence of 11% sodium chloride in the brine, adding furthermore glucose and nitrate. The cured fillets were tested organoleptically, their colour and ripeness proved to be much better than non-ripened herring fillets "nach Matjes Art". There seems to be opprotunity for improving the process furthermore-genuine matje fillets got still higher ratings than the experimental products. AS

Mackerels

185 Clifford (MN), Walker (R), Wright (J), Hardy (R) and Murray (CK). Studies with volunteers on the role of histamine in suspected scombrotoxicosis. Journal of the Science of Food and Agriculture 47(3); 1989; 365-375

The results are reported of single-blind, medically supervised studies in volunteers of the association between the histamine content of mackerel and the incidence of scombrotoxicosis. Volunteers consumed 25 or 50 g of fresh or spoiled mackerel containing varying quantities of endogenous or added histamine. In one study the ability of H1 and H2 histamine antagonists to modify symptoms was investigated. Objective parameters (pulse rate, skin temp. and peak expiratory flow rate) were recorded for 6 h, and subjective parameters (headache, flushing, oral tingling, visual disturbances, abdominal pain, nausea, palpitations, wheeziness, diarrhoea, flatulence, shivering and miscellaneous) for 24 h. No significant effects were observed, even with portions of spoiled mackerel containing 300 mg histamine, or mackerel from a batch which was reported to have been associated with an incident diagnosed as scombrotoxicosis. It is concluded that the precise combination of circumstances required to cause a scombrotoxic event were not reproduced in these studies, but it is tentatively concluded that histamine alone is unlikely to be the causative agent. AS

Products

Fish oils

186 Furst (F), Furst (C) and Groebel (W). Determination of polychlorianted terpenes in fish oils. Deutsche Lebensmittel-Rundschau 85(9); 1989; 273-279 (De).

A method is described for the determination of polychlorinated terpenes in cod- and halibut liver oils. Extraction and clean up of the samples were carried out according to the multi residue procedure by Specht and Tillkes. Separation and detection of the compounds were performed by use of capillary gas chromatography/mass spectrometry with negative ion chemical ionization (NICI) and selected ion monitoring (SIM). All cod- and halibut liver oils analysed so far revealed typical patterns of polychlorinated terpenes. Due to metabolism the fish oil samples showed a distinctive differences in the relative ration of the isomers compared to technical mixtures, like toxaphene or strobane, resp. An accurate quantitation of polychlorinated terpenes in samples which underwent biodegradation does not seem possible at the moment because no definite constituents but only technical mixtures are commercially available up to the present. The difficulties stemming from this are demonstrated with some examples. The method presented also records residues of higher chlorinated chlordane constituents. Levels of these compounds in fish oils are also presented. AS

PROTEIN FOODS

Infant foods

187 Li-Chan (E) and Nakai (S). Enzymic dephosphorylation of bovine casein to improve acid clotting properties and digestibility for infant formula. Journal of Dairy Research 56(3); 1989; 381-390

To improve acid clotting properties, enzymic dephosphorylation of caseins with calf intestinal alkaline phosphatase (CAP) or potato acid phosphatase (PAP) was investigated. Greater dephosphorylation was achieved using alpha$_{S1}$ - or beta-casein as substrates, compared to whole casein or skim milk. Electrophoresis of PAP-modified caseins revealed blands with lower mobility and a multibanded pattern in the beta-casein region which was similar to that of human beta-casein. On the other hand, CAP modification produced electrophoretic bands having lower mobility of the beta-casein component, but with higher mobility in the alpha casein component as well as increased net negative charge in the CAP-casein. PAP-casein formed a fine dispersion upon acidification to pH 4. with a microstructure similar to that of acidified human casein. Greater initial rates of hydrolysis by pepsin at pH 4 were observed for both CAP and PAP- modified caseins, compared to bovine and human caseins. The rate and extent of hydrolysis remained high for CAP casein but tended to level off with PAP-casein during sequential digestion with pepsin and pancrea-

tin. There many be advantages in the use of partial dephosphorylation to improve acid clotting and digestibility properties of bovine casein for infant feeding. AS

ALCOHOLIC AND NON-ALCOHOLIC BEVERAGES

Alcoholic beverages

Wines

188 Lopez (LF), Lopez (AG) and Riba (MV). HPLC method for simultaneous determination of fungicides. Carbendazim, metalaxyl, folpet, and propiconazole in must and wine. Journal of Agricultural and Food Chemistry 37(3); 1989: 684-687

In this paper a simple HPLC method for simultaneous detn. of fungicides viz. carbendazim, metalxyl, folpet and propiconazole in must and wine has been described. Reversed phase column (spherisorfo DS-1C_{18}) with an acetonitrile water gradient as mobile phase are used for the analyses. Absorbance at 220nm is recorded as compounds are separated and this method provided minimum detectable levels between 4 and 8 µ g/L for the above four fungicides. NGKR

Palm wines

189 Cunningham (AB) and Wehmeyer (AS). Nutritional value of palm wine from Hyphaene coriacea and Phoenix reclinata (Arecaceae). Economic Botany 42(3); 1988; 301-306

Nutritional data of palm wine from Hyphaene coriacea and Phoenix reclinata showed that palm wine is an important source of nicotinic acid and vitamin C. BV

Non-alcoholic beverages

Coffee

190 Aeschbacher (HU), Wolleb (U), Loliger (J), Spadone (JC) and Liardon (R). Contribution of coffee aroma constituents to the mutagenicity of coffee. Food and Chemical Toxicology 27(4); 1989; 227-232

In this study about 40 coffee aroma constituents belonging to the classes of dicarbonyls, sulphur compounds, furfuryls, N-heterocyclics and others were systematically evaluated in three Ames Tester strains. It was seen that only aliphatic dicarbonyl compounds showed notable direct mutagenic activity and very weak effects were also seen with some N-heterocyclics which do not contribute substantially to the mutagenicity in coffee. The absence of coffee mutagenicity/carcinogenicity in rodents with these highly reactive coffee aroma compounds can be explained in part by detoxification of microsomal enzyme systems. NGKR

191 Blanc (MB), Davis (GE), parchet (J-M) and Viani (R). Chromatographic profile of carbohydrates in commercial soluble coffees. Journal of Agricultural and Food Chemistry 37(4); 1989; 926-930

This study was undertaken to detect adulteration in commercial soluble coffee preparations by estimation of free and total sugar contents. Pure soluble coffee is found to contain about 0.3% total xylose and sucrose and about 2% total glucose but no maltose. Presence of total xylose indicated extraction of coffee with husks/parchments whereas presence of high level of free fructose and glucose indicated either raw or roasted husks/parchments being added. Higher levels of maltose and total glucose showed addition of maltodextrins and higher levels of sucrose and total glucose showed addition of caramalised sugar. NGKR

Fruit juices

192 Baumann (G) and Gierschner (K). Manufacturing of clear fruit juices by means of ultrafiltration. New developments. Deutsche Lebensmittel-Rundschau 85(11); 1989; 344-350 (De).

Apple juices

193 Sandhu (KS), Singh (S), Singh (N), Sekhon (KS) and Bawa (AS). Effect of pectic enzyme treatment on juice yield and composition. Indian Food Packer 43(6); 1989; 12-14

Juice recovery from apple on treatment with pectic enzyme was evaluated. The grated pulp of 'Maharaji' and 'Red Delicious' apple was treated with 0.3% pectic enzyme after addition of 150 p.p.m. potassium metabisulphite, incubated for 30h at 20-25 C the juice extracted with hydraulic press, and pasteurized at 80 C for 5 min. The juice recovery increased by 20.07% in the 'Maharaji' var. and by 9.79% in 'Red Delicious' var. with pectic enzyme treatment. The proximate constituents in pectic enzyme extracted juice were higher. The enzyme treatment resulted in a clear juice but the browning was increased. KAR

Citrus juices

194 Bhalerao (SD) and Mulmuley (CV). Dehydrated citrus pips. A valuable adjunct for dry beverage mixes. Indian Food Packer 43(6)20-23;

The soft drinks prepared from the concentrated powders lack the feel of natural juice. To make up this deficiency, dry citrus juice sacks (pips) were prepared for incorporation in these mixes to enhance the consumer appeal. The lime juice and orange juice pips dried (fluidized bed drying and osmotic drying), sieved, packed in 200 gauge polyethene bags and stored under ambient conditions (15-40 C, 20-93% R.H.) retained their quality for more than a year. Osmotically dried product rehydrated immediately and the fluidized bed dried products took 5 min at room temp. Addition of 0.01% (w/v) of dry pips or 0.05% (w/v) of osmo-dried pips gave desired appearance and mouthfeel to the final drink as judged by sensory evaluation.

The dry pips stored for a period of more than one yr and retained all the quality attributes. The fluidized bed dried lime pips cost Rs. 80/- and orange pips cost Rs. 100/- per kg. VKR

Grapefruit juices

195 Johnson (RL) and Chandler (BV). Kinetic studies of adsorption of bitter principles and titratable acid from grapefruit juice. Journal of Chemical Technology and Biotechnology 44(3); 1989; 225-236

Measurement of the initial rates of removal of limonin and naringin from grapefruit juices by several polytyrene and polyacrylic adsorbents has allowed these absorbents, in the forms as supplied, to be ranked in their order of kinetic effectiveness for removal of the two bitter principles between juice and polystyrene adsorbent resins show that the capacity of such resins for naringin increases with specific surface area, but the capacity for limonin appears to increase with specific pore vol. With respect to titratable acid, the two weak base resins, Amberlite IRA-93 and Duolite A378, were equally effective both kinetically and in their capacity for titratable acid; both absorbed somewhat less than 1 mol of titratable acid from grapefruit juice per equivalent of weak base resin. AS

196 Rouseff (RL), Fisher (JF) and Nagy (S). HPLC separation and comparison of the browning pigments formed in grapefruit juice stored in glass and cans. Journal of Agricultural and Food Chemistry 37(3); 1989; 765-769

A procedure was developed to allow characterization of the browning pigments formed in grapefruit juice and also to study the variations due to container, temp. and time of storage. These pigments were separated by an HPLC procedure using a ternary solvent gradient with a C_{18} column. This system consisted of water, acetonitrile and tetrahydrofuran. The type and quantity of pigments depended on the container and more were formed in bottles than in cans. Some pigments were seen to be unstable and disappeared due to longer storage periods while some increased with storage periods. The browning was due to these pigments both in cans and bottles and temp. also increased the browning pigments. NGKR

Orange juices

197 Aristoy (MC), Orlando (L), Navarro (JL), Sendra (JM) and Izquierdo (L). Characterization of Spanish orange juice for variables used in purity control. Journal of Agricultural and Food Chemistry 37(3); 1989; 596-600

This investigation was carried out to determine amino acids, sugars, minerals, ash, citric and isocitric acid and spectral characteristics of Spanish pure orange juices and their variations due to season and var. For this study 147 samples of orange conc. of 65 Brix obtained from white and Navel oranges collected in Spanish citrus plants from December to May during two crop seasons and stored at -18 C. After reconstitution to 11 Brix with redistilled water

the analyses were performed by standard procedures. From the results the differences were found to be significant at 99 % level and the samples cannot be considered a unique references population to detect dilution and were also poor and erroneous. Both problems could be avoided by considering independent populations corresponding to the different seasons and groups var. NGKR

198 Sattar (A), Durrani (MJ), Khan (RN) and Hussain (B). Effect of different packages and incandescent light on HTST-pasteurized single strength orange drink. Chemie Mikrobiologie Technologie der Lebensmittel 12(2); 1989; 41-45

Effect of incandescent light on HTST pasteurized single strength orange drink (SSOD) packed in clear, green and amber glass bottles and coextruded wax laminated paper (Tetra Pak), was studied during 32 days storage at ambient room temp. chemical analysis revealed significant effect of packages and light on different quality parameters during storage ($P < 0.05$). Ascorbic acid losses were found to be 66.0, 59.9, 5.19, and 50.3% in clear glass, green glass, Tetra pak, and amber glass resp. against 42.4% in the unexposed control during the entire storage. Titratable acidity, Brix, and light transmission generally showed an increasing pattern with advanced storage. Brown glass provided the best protection followed by Tetra-Pak, green glass, and clear glass. Evaluation of juice for sensory components revealed a congruent pattern of changes in the ratings in relation to different packages. AS

Tea

199 Owuor (PO) and Othieno (CO). Effects of maceration method on the chemical composition and quality of clonal black teas. Journal of the Science of Food and Agriculture 49(1); 1989; 87-94

Crush, tear and curl maceration improved the theaflavin and thearubigin contents and briskness, 'brightness' and 'thickness' of black teas (Camellia sinensis (L) Q Kuntze), whereas orthodox manufacture produced teas with larger amount of caffeine and Groups I and II volatile flavour compounds, and with a better flavour index and superior flavour. Thus orthodox manufacture was found to produce better flavour teas whereas crush, teas and curl manufacture produced better plain teas. Clonal differences in all the chemical quality parameters were noted. AS

200 Ullah (MR), Gogoi (N) and Baruah (S). A rapid method for extraction and spectrophotometric determination of caffeine in tea. Two and a Bud 34(1-2); 1987; 50-53

An ultraviolet spectrophotometric method which is simple and rapid has been developed for the estimation of caffeine in tea (Camellia sinensis). Caffeine was extracted from tea samples with alkaline methenyl chloride and the recovery of caffeine was exhaustive and complete. The standard curve over the concn. range of 2 to 6 μ g/ml against the observed O.D. at 276 nm was found to correspond to g caffeine/100 g of tea sample. Hence the % of caffeine in the

sample could be directly read from the standard curve. The value for caffeine. was in good agreement with that determined gravimetrically. This method could be adopted for routine detn. of caffeine in black tea, instant tea and dried green tea leaf. KAR

FATS AND OILS

201 Chakrabarty (MN). Biotechnology in the oils and fats industry. Science and Culture 55(7); 1989; 224-227

A short review which covers aspects like application of lipase; fat splitting; interesterification, ester synthesis; modification of fatty acids, oxidative reaction and biohydrogenation. KAR

202 Eggers (R) and kaschel (G). Deformation characteristics of oilseeds during pressing process. FAT Science and Technology 91(6); 1989; 213-219 (De).

Up to now the deformation of compactable fixed beds made of natural material is described by the well-known press-equation. The specific quantities "proportion of radial to axial pressure" and the "coeff. of friction" are nearly unknown. By using rapeseed of different condition, the deformation characteristic is going to be determined in a special test apparatus by taking up axial-and radial pressure profils. Thus the proportions or radial to axial pressure and the coeff. of friction can be derived. The results are to be considered as a contribution to design gas sealing sections for continuous transport of seeds through pressure vessels. At the same time in order to facilitate comprehension of the events happening at solid/liquid separation by expression processes, the influence of the contents of seed oil under compressing by mechanical pressure is checked. AS

Fats

203 Blekas (G) and Boskou (D). Oxidation of stigmasterol in heated triacylglycerols. Food Chemistry 33(4); 1989; 301-310

A triacylglycerol mixture containing 5% stigmasterol by wt. and devoid of other unsaponifiables was heated at 180 plus or minus 5 C for several h. Oxidation products from stigmasterol were separated and isolated by column chromatography and preparative thin-layer chromatography. Characterization of individual compounds was based on chromatographic mobilities, specific colour reactions, UV and IR spectroscopy and fragmentation patterns from the mass spectra of the purified oxidation products. A hydrocarbon (stigmasta-3, 5, 22-triene), a triunsaturated ketosteroid (stigmasta-3, 5, 22-triene), a diunsaturated ketosteroid (stigmasta-4, 22-dien-3-one) and a pregnane derivative (Delta - pregnen-3beta-ol-2-one) were identified. There is also evidence for the presence of more polar compounds such as hydroxy and epoxy derivatives. AS

204 Zsinka (AJN), Peredi (J), Szepvolgyi (J), Maucha (E), Foldes (V) and Biró (G). Effect of interesterified fat mixtures on certain lipid indices in experimental fat metabolism disturbance. Nahrung 33(2); 1989; 107-118

Butter oil

205 Christen (GL). A method to quantify butteroil added to butter-margarine blends. Journal of Food Quality 11(6); 1989; 453-459

Table spreads containing various amounts of butteroil blended with vegetable oils are now commercially available. The butter fat percentages in these blends range from 2-4% according to the label information. This research was designed to determine the efficacy of a gas chromatographic procedure for monitoring the quantity of butteroil in the blend. Methyl esters were formed using potassium methoxylate as a catalyst and a heating interval of 2 min at 65 C in a closed vial under a N atm. Carbon disulphide was used to extract the fatty acid methyl esters which were then separated by capillary gas chromatography. Retention times, peak areas and relative concn. were determined by an integrator connected to the chromatograph. Changes in chromatographic patterns were monitored as known wt. of butteroil were added to melted margarine. Dodecanoic, tetradecanoic, and pentadecanoic acids increased proportionately as butteroil was added to margarine. Commercial butter-margarine blends were prepared using the same procedure and the quantity of butteroil present was predicted by regression analysis. AS

Butterfat

206 Miyamoto (T), Nakae (T) and Nakazawa (Y). Oxidation of double bonds in unsaturated fatty acids of butterfat. Lebensmittel-Wissenschaft und-Technologie 22(3); 1989; 107-111

Various kinds of acids assumed to be monocarboxylic and diacarboxylic acids produced by oxidation of butterfat were examined by gas chromatography and gas chromatography-mass spectrometry. Odd number in carbon of fatty acids hardly known to exist in ordinary butterfat was observed in the oxidized products. The origin of newly-formed acids was estimated and the quantitative ratio of them was calculated as an index. This index is considered to represent the characteristics nature of various animal and vegetable fats and oils, and also to provide new detection methods of adulteration and characterization of fats and oils. AS

Oils

207 Jackman (RL), Yada (RY) and Paulson (AT). Characterization of the kinetics of breakdown of protein stabilized oil in water emulsions. Journal of Agricultural and Food Chemistry 37(3); 1989; 600-604

The breakdown of oil in water emulsions, after initial formation, in the presence of 0.1% (w/v) whey, potato, pea, or soy proteins at pH 4-8 was monitored by measuring the absorbance at 500

nm of emulsions diluted in 0.1% (w/v) SDS after various time periods. Emulsion breakdown/absorbance decay was asymptotic, decreasing to an equilibrium value that was pH and protein dependent. Application of nonlinear modeling techniques revealed breakdown of protein-stabilized emulsions to follow first-order kinetics ($P < 0.001$). Use of a two-phase first-order model to characterize emulsion breakdown is also discussed. Results from this study emphasize the need to use appropriate statistical techniques to analyze replicated emulsion breakdown data; failure to do so could lead to biased estimates of kinetic parameters. AS

208 Sattar (A), Jan (M), Ahmad (A), Hussain (A) and Khan (I). Light induced oxidation of nut oils. Nahrung 33(2); 1989; 213-215

The nuts are invariably sun-dried in Pakistan, Iran, Afghanistan and adjoining areas of China and USSR. Their oils are generally kept in the unrefined form, being exposed to light during subsequent handling or marketing and consequently undergo changes in colour, flavour and chemical changes. Light induced reactions have been found to damage the quality and stability of edible oils, fats and fat containing food products. Oil characteristics of walnuts. and oxidation of almond and walnut oils during heating have been studied. Influence of clear flexible pouches and amber-colour bottles on storage behaviour of groundnut oils was reported by Mahadevaiah etal. and Nasirullah etal. Dry nut oils are generally sold in clear glass bottles in Pakistan and several other countries but their stability to fluorescent light in relation to different packages has not been tested, which is the object of these studies. AS

209 Welsh (FW) and Williams (RE). The use of vegetable oils to recover compounds from aqueous solutions. Journal of Chemical Technology and Biotechnology 46(3); 1989; 169-178

Corn oil, canola oil, olive oil, sunflower oil, peanut oil and soybean oil were tested as extractants for the recovery of organic compounds from aqueous solution. Short chain aliphatic alcohols and acids were poorly recovered ($K_d < 1.0$) while most esters, aldehydes and aromatic compounds tested were satisfactorlly recovered ($K_d > 2.0$) from aqueous solution by vegetable oils. K_d is defined as the ratio of the concn. of the dissolved substance in the extractant to that in the aqueous phase. The exception was caffeine which was poorly extracted from water. The type of oil used appeared to have limited effect on K_d. Increasing the reaction temp. resulted in increased K_d for most readily extractable compounds. Acidulated fatty acid was also tested as an extractant. Although it generally resulted in a greater K_d than the oils or hexane control, acidulated fatty acid was less desirable as an extractant because it tended to create an emulsion with the aqueous phase under the test conditions. AS

Coconut oils

210 Lim-Sylianco (CY). Inhibition of chemical carcinogenesis by coconut oil. ASEAN Food Journal 4(3); 1989; 93-97

Results indicate that the reactivity of the different mutacarcinogens with DNA was inhibited by coconut oil. The initiation stage, the alteration of DNA structure, can be inhibited by coconut oil. SRA

Palm oils

211 Sundram (K). Inhibitory effect of palm oil on cancer progression. ASEAN Food Journal 4(3); 1989; 87-91

Palm oil has been shown to have an inhibitory effect on cancer development but the actual mechanism of this inhibitory action is poorly understood. The fatty acid comp. of palm oil is more favourable than polysaturated oils in inhibiting tumar progression. The tocopherols, tocotrienols and carotenoids protect against membrane peroxidation and free radical formation. The effectiveness of these two co-existing vitamins in possibly combating tumorgenesis in still unknown. Palm oil may be proven to be protective is cirbain carcinogenic environments. SRA

Soybean oils

212 Guth (H) and Grosch (W). 3-methylnonane-2,4-dione-an intense odour compound formed during flavour reversion on soybean oil. FAT Science and Technology 91(6); 1989; 225-230

213 McDonald (RE), Armstrng (DJ) and Kreishman (GP). Identification of trans-diene Isomers in hydrogenated soybean oil by gas chromatography, silver nitrate thin-layer chromatography, and ^{13}C NMR spectroscopy. Journal of Agricultural and Food Chemistry 37(3); 1989; 637-642

Soybean oil was hydrogenated with use of a sulphur-containing nickel catalyst to produce high levels of trans-diene isomers. The isomers were derivatized to methyl esters and then fractionated by preparative silver nitrate thin-layer chromatography (TLC). Each TLC band was recovered and analyzed by capillary gas chromatography (GC). The identity of specific trans-dienes was confirmed by ^{13}C nuclear magnetic resonance (^{13}C NMR). Packed-column GC using a 6.1 m x 2 mm OV-275 column gave an accurate indication of the total amount of trans-dienes present, while a 50 m x 0.22 mm capillary column containing (cyanopropy) polysiloxane separated the individual trans-diene isomers. By ^{13}C NMR, the three major trans-diene isomers were identified as cis-9, trans-12-octadecadienoic acid, trans-9, cis-12-octadecadienoic acid, and trans-9, trans-12-octadecadienoic acid. AS

SPICES AND CONDIMENTS

Spices

214 Blenford (D). Open sesame. Food 11(6); 1989; 27-28

This is a general article on different types of spices, their importance and applications. The spices include black pepper, ginger, nutmug, cinnamon, sage, chillies, funugreek etc. SYR

215 Sambaiah (K) and Srinivasan (K). Influence of spices and spice principles on hepatic mixed function oxygenase system in rats. Indian Journal of Biochemistry and Biophysics 26(4); 1989; 254-258

The status of hepatic mixed function oxygenase system (MFOS) was investigated in rats fed spice principles: capsaicin at 3 and 15 mg %, piperine at 4 and 20 mg % and curcumin at 0.1 and 0.5% as well as spice: cumin at 0.25 and 1.25%, ginger at 10 and 40 mg %, fenugreek 0.5 and 2.0%, cinnamon 10 and 50 mg %, asafoetida at 50 and 250 mg %, mustard at 50 and 250 mg % and tamarind at 0.5 and 2 5%. Liver microsomal cytochrome P_{450}- dependent ryl hydroxylase was generally stimulated by these spice principles and spices. Cumin, ginger and fenugreek also stimulated the levels of cytochrome 450 and cytochrome b^5 and cumin and tamarind stimulated N-demethylase activity. NADPH-cytochrome C reductase and glucuronyl transferase activities, however, remained unaffected by the spice tested. KAR

Curcuma

216 Srinivasa Rao (A), Rajanikanth (B) and Seshadri (R). Volatile aroma components of Curcuma amada Roxb. Journal of Agricultural and Food Chemistry 37(3); 1989; 740-743

In this study the aroma conc. of fresh rhizomes of Curcuma amada Roxb. was prepared by an efficient steam distillation/solvent extraction simultaneously. The qualitative analysis of these volatile aroma compounds was done by GC/MS aided by computer library research. 61 compounds earlier unreported out of 68 compounds have been identified and their mass spectra recorded and confirmed by their Kovats Indices. It was seen that the aroma conc. of mango ginger comprised a mixture of characteristic impact compounds of both raw mango and turmeric. NGKR

Garlic

217 Yu (T-H), Wu (C-M) and Chen (S-Y). Effects of pH adjustment and heat treatment on the stability and the formation of volatile compounds of garlic. Journal of Agricultural and Food Chemistry 37(3); 1989; 730-734

In this study the effects of pH adjustment after blending 30

min standing and heat treatment of garlic cloves on the stability and the formation of volatile compounds of garlic were determined by GC. It was seen that the amount of the two isomeric cyclic compounds 3-vinyl-4 H-1, 2 dithiin and 2-vinyl-4 H-1, 3 dithiin which were arti-. facts from allicin decreased with increasing pH values whereas the amount of diallyl disulphide propenethiol, propyl allyl disulphide and diallyl sulphide increased with increasing pH values. Formation of diallyl trisulphide, methyl allyl trisulphide, 1, 3-dithiane, 2, 4 dimethylfuran, aniline, and tran-1-propenyl methyl disulphide were preferred in rentral-conditions whereas formation of methyl allyl disulphide, methyl allylesulphide, 1-2-epithiopropane, and methyl propyl disulphide were preferred around pH 9.0. NGKR

218 Yu (T-H), Wu (C-M) and Liou (YC). Volatile compounds from garlic. Journal of Agricultural and Food Chemistry 37(3); 1989; 725-730

In this paper the studies on the constituents of garlic oils, their essential oil identification together with comparitive data on their comp. by different extraction techniques. The volatile oils were extacted by water distillation, steam distillation and L-N distillation/solvent extraction with/without steam resp. The volatile oils were analysed and identified by capillary GC and combined GC-MS and the yield of garlic oil was found to be 0.22 plus or minus 0.01% (w/w). The comp. revealed monosulphides, disulphides, and trisulphides and for the first time 13 out of 28 components were reported. The essential oils obtained by L-N distillation, solvent extraction contained more 2-4-dimethylfuran, 2-propen-1-ol, anilin, and 3-5 diethyl-1,2, 4-trithiolane than those from water distillation and steam distillation. The essential oils obtained from steam distillation contained more high volatility compounds and less low volatility compounds than those by water distillation. NGKR

Laser trilobum

219 Akgul (A). A new spice from Turkey Laser trilobum (L). Borkh. I. Inhibitory effect on food contaminating microorganisms. Acta Alimentaria 18(1); 1989; 65-69

The sensitivity of thirty foodborne microorganisms to a new spice, the fruit of Laser trilobum (L.) Borkh., the essential oil, and one of its main constituents, perillaldehyde, were studied in culture media. At ground spice concn. of 1.0-4.0%, bacteria and yeasts were more sensitive than moulds tested. The essential oil at 0.01-0.1% exerted a weak inhibitory effect on all organisms. A concn. of 0.1% of perillaldehyde inhibited completely the growth of the moulds and bacteria studied, except Pseudomonas aeruginosa, while it showed slight activity on yeasts. In general, ground spice exhibited a higher antibacterial and anti-yeast activity than essential oil and perillaldehyde. It was also concluded that the antimicrobial property of the spice depended also on non-volatile constituents. AS

SENSORY EVALUATION

220 Nasrawi (CW) and Pangborn (RM). The influence of tastants on oral irridation by capsicin. Journal of Sensory Studies 3(4); 1989; 287-294

The present study reports on the influence of tastants (sucrose, NaCl and citric acid) and solution viscosity (xanthan gum) on perceived intensity of mouth burn of capsicin by caters and non caters of chillis. Oral irradiation from solution of 2 p.p.m. capsacicin, capsaicin with added sucrose (0.04 M), NaCl (0.3 M) and citric acid (0.01 M) or xanthan gum (0.2%). It was found that only sucrose decreased mouth burn both in quality and duration whereas the viscosity imparted by xanthan retarded mouth-burn but not its duration. This showed that eaters and non-eaters of chillis did not differ in their perception of mouth-burn. NGKR

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

221 Yang (RZ) and Tang (CS). Plants used for pest control in China. A literature review. Economic Botany 42(3); 1988; 376-406

In this review information on the use of herbal pesticides in China, primarily from the late 1950's is summarized. A table containing 267 pesticidal plants is compiled to provide a glimpse of the Chinese experience. 30 references. BV

BIOCHEMISTRY AND NUTRITION

222 Muzaffar (M), Bakhsh (R), Khan (S) and Salecm khan). Effect of different dietary brans on lipid metabolism in male albino rats. Nahrung 33(2); 1989; 167-170

Male albino rats were fed different dietary brans at 20% level for two months to study their effect on lipid metabolism. Wheat and corn brans significantly ($P < 0.05$) decreased the serum cholesterol level while chickpea bran significantly ($P < 0.05$) lowered the liver and heart cholesterol concn. Significant ($P < 0.05$) reduction was observed in liver and heart triglyceride with all brans. Wheat, corn and chickpea brans fed at 20% level had no significant effect on serum triglyceride concn. AS

223 Schulze (J) and Friedrich (M). Physicochemical properties of dietary fibre. One basis of action. Ernahrungsforschung 33(3); 1988; 49-51 (De).

Chemical structure, texture and physical properties of dietary fibre are responsible for its actions in the GI tract. Particular properties are water holding, gelling activity, cation and sterol binding. Resulting effect already set in both stomach and small intestine and continue partially during the passage through the large intestine. They influence the metabolism of macroorganism. Some dietary fibre actions are explicable by physicochemical properties. Hypothesises are discussed. AS

224 Schulze (J), Zunft (H-J), Friedrich (M) and Haenel (H). Dietary fiber in our food. Ernahrungsforschung 33(1); 1988; 4-6 (De).

Dietary fibre belongs to that kind of food components, which escapes principally (obligatory dietary fibre) or under special conditions (potential dietary fibre) from the digestion in the small intestine. It originates almost exclusively from vegetable food constituents. In this connection amorphous ground substances, the main components of which are pectins, hemicelluloses, celluloses and lignins, are of special importance. Vegetable gums, swelling agents and mucoids, sustentacular substances as well as microbial polysaccharides and chemically modified polysaccharides also gain in importance as auxiliary materials in food technology. An increase in dietary fibre intake up to the internationally generally recommended minimum quantity of 30 g/day can only be reached with an increased intake of cereal wholemeal products as well as of fruits and vegetables. AS

225 Breton (C), Phan Thanh (L), Dubray (G) and Paraf (A). Apparent discrepancies between immunochemical methods used for ovalbumin recognition in food. Journal of the Science of Food and Agriculture 47(3); 1989; 311-325

The specificity of rabbit anti-native ovalbumin antibodies against native ovalbumin (NOA) or heat-denatured ovalbumin (HDOA) was studied by affinity chromatography ELISA techniques, quantitative immunoprecipitation and HPLC. Affinity-purified antibodies were prepared either by passing antisera successively on an NOA column and an HDOA column, or vice versa. Antisera were found to contain about 85% of antibodies directed against NOA, 7% specific for HDOA and 8% retained by both columns. It is shown that antibodies specific for NOA fully precipitated NOA in liquid-phase precipitation but were unable to bind NOA is ELISA using NOA-coated plates, while recognising NOA trapped on the solid phase by a first layer of antibodies:ovalbumin was thus completely denatured during interaction with plastic as shown also by the fact that antibodies specific for HDOA reacted with NOA-coated plates. These results point out the need to modify ELISA tests for monoclonal antibodies selection and for structural studies of food molecules in complex mixtures. However, this observation, which holds true for ovalbumin, might not apply to all antigens. AS

226 Nishimura (T) and Kato (H). Taste of free amino acids and peptides. Food Reviews International 4(2); 1988; 175-194

This review covers taste of free amino acids and peptides (sweet, bitter, sour, salty, umami and other tastes) and role of free amino acids and peptides in food taste. 80 references. SRA

227 Erdman (JWJr). Nutrition. Past, present and future. Food Technology 43(9); 1989; 220-226

This review focuses on advances in the field of nutrition during the past 50 yrs. The present status of nutritional sciences and fertile areas for future nutrition research and policy is also emphasized. 17 references. SRA

228 Horie (Y), Wahlqvist (ML), Read (RSD) and JonesGP). Dietary fibre contents of some traditional Japanese foods. ASEAN Food Journal 4(3); 1989; 117-119

229 Ramesh Puri and Tejinder Sanghera. Nutritive value and consumption pattern of some processed foods. Indian Food Packer 43(6); 1989; 24-28

The survey on consumption of processed mixed fruit jam, orange squash and pineapple juice was conducted on 200 households in Chandigarh city, India. These comprised of three socio-economic groups (middle income with Rs. 500/-; high-middle income with Rs. 501-1,000 and high income with Rs. 1000 and above per capita per month). Jam was popular in all households irrespective of income, though a linear increase was observed with education of women and family income. Orange squash consumption was max. in high middle income and pineapple juice consumption showed an increase with a rise in income. The consumption of these processed foods showed a linear increase with higher education of women. These convenience foods could be used where a low protein, low fat and high calorie diet is required. VKR

TOXICOLOGY

230 Brunn (H), Georgii (S), Stelz (A) and Muskat (E). Xenobiotics in foodstuffs-estimation of daily food intake. II. Determination of polychlorinated biphenyl in invalid diets and body foods. Deutsche Lebensmittel-Rundschau 85(9); 1989; 286-290 (De).

Six selected PCB-congeners and 2,2',4,4' -tetrachlorobiphenyl (congener No. 49) were determined in the daily diet of three German hospitals and in baby food. The congeners Nos. 101, 153, 138 and 180 could be proven in most samples. The low chlorinated biphenyls (congeners Nos. 28, 49, and 52) were under the detection limit. Based on these results the average daily intake was estimated with help of model calculations at 4.1 µ g PCB (sum of the congeners), or 0.06 u g/kg PCB in relation to the body wt. The equivalent daily intake for a six month old child is 0.13 µ g/kg PCB per body wt. These results show that the average daily intake of the polychlorinated biphenyls

are still far below the at present discussed acceptable daily intake of 1 µg/kg per body wt., and that the intake due to polychlorinated biphenyls in foodstuff has decreased in the last yrs. AS

231 Hall (RL) and Taylor (SL). Food toxicology and safety evaluation. Changing perspectives and a challenge for the future. Food Technology 43(9); 1989; 270-279

Article deals with the genesis of food toxicology, evolution of toxicology testing and interpretation, factors shaping food toxicology, food toxicology today, problems of today and the challenges of the future. 26 references. SRA

FOOD LAWS AND REGULATIONS

232 Hutt (PB). Regulating the misbranding of food. Food Technology 43(9); 1989; 288, 290-295

233 Middlekauff (RD). Regulating the safety of food. Food Technology 43(9); 1989; 296-297, 300-307

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INDEX

Acanthoscelides obtectus
seed lectin tolerance by Acanthoscelides obtectus 73
Acceptability
sweet cherries, quality & consumer acceptance of stemless 119
Acidophilus milk
protein quality of acidophilus milk 154
Acids
cocoa seeds, fermentation & acid changes in 123
Adulteration
coffee, adulteration chromatographic detection in commercial soluble 191
Aerosols
dairy processing plants, biological aerosols air borne contamination in 136
Aflatoxins
milk/ milk products, test method standardization for aflatoxin detn. in 138
Algae
Dunallella bardawil, safety evaluation of 32
Almond proteins
almond, protein comp. of developing 79
Almonds
carbohydrate/ protein content/ comp. of developing almond seeds 79
irradiation disinfestation & bichemical quality of dry almonds 78
rancidity detection by chemical analysis in stored almonds 17
Amino acids
bread, amino acid of flat 128
corn germ protein, amino acid comp. of frankfurters supplemented 67
fish meal, amino acid ion-exchange/ gas-chromatographic analysis in 182
taste of free amino acids, review 226
tomato seeds, amino acid profile of canning waste 102
tomatoes, amino acids of 104
Aminoglycosides
eggs, aminoglycoside antibiotic residues in 179
Analytical techniques
foods, Direct epifluorescent filter techniques analysis of 22
foods, Direct epifluorescent filter techniques analysis of 21
Antagonism
Pseudomonas sp., iron & antagonism of 37
Anthracnose
mangoes, anthracnose & physiological state of 118
Antimicrobials
L. acidophilius, nutrient media/ bile salt & antimicrobial activity of 134
Laser trilobum, antimicrobial properties of 219
Antinutritional properties
cowpeas, processing method & antinutritional properties of 76
Apple juices
pectic enzymes & yield/ comp. of apple juices 193
Aroma compounds
coffee, aroma constituents & mutagenicity of 190
curcuma, volatile aroma compounds of 216
Astringent compounds
milk, astringent compounds isolation/ partial purification from UHT sterilised 142
Atomic absorption spectroscopy
foods, Cr AAS detn. in 19
Automation
computers use in food industries 14
flour mills, automation in 15
Bacillus cereus
eggs, plasmids & Bacillus cereus differentiation in 181
Bacon
2-(hydroxymethyl) -N-nitrosothiazoline occurrence/ detn. in fried bacon 173
Bacteria
herring fillets, starter bacteria & curing of 184
milk, ice-nucleating bacteria abnormal freezing of 143
Bacterial quality
milk, bacterial quality of market 144

Baking quality
wheat flour mixture, baking quality of 60
wheat, baking quality HPLC prediction in bread 56
Barley
hydrogen & fermentation products of barley 48
kernel development/ storage & glucan content/ solubility during barley 47
modification of barley during malting 49
Beef
acridine orange direct-count technique & microorganisms emumeration in beef 170
animal behaviour/ environment & dark-cutting condition in beef, review 169
carcass characteristics/ sensory properties/ mineral content of bull/ steer meat 168
longissimus, tallow supplementation & fatty acid distribution in beef 165
longissimus/ semimembranosus muscles, electrical stimulation/ blade tenderization & palatability of beef 166
Beef steaks
fat level/ cooking methods & physical/ sensory properties of restructured beef steaks 167
Berries
carotenoids in Finnish berries 18
Beverages
mixes, dehydrated citrus pips for dry beverage 194
Biochemical quality
nuts, irradiation disinfestation & biochemical quality of dry 78
Biotechnology
food processing industry & biotechnology 39
oil/ fat industries, biotechnology in, review 201
Bitter principles
grapefruit juices, bitter principles from 195
Bitterness
casein, hydrolysates bitterness/ solubility & proteolysis of 159
Black peppers
214
Blanching
cauliflower, blanching & quality of frozen 98
cauliflower, blanching & residual peroxidase activity in frozen 99
Boiling
groundnut comp., salt concn./ boiling effect on 80
Brans
lipid metabolism in male albino rats, dietary bran effect on 222
Bread
dough, peptides isolation/ purification/ detn. from bread 127
phytic acid/ in vitro protein digestibility/ amino acid comp. of flat bread 128
staling detn. in Egyptian-type bread 129
wheat, baking quality HPLC prediction in bread 56
Broad bean proteins
waste water recirculation & quality of broad bean proteins 74
Broilers
sp., comp./ carcass quality of broiler 177
Butter
butter oil quantification in butter-margarine blends 205
fats, unsaturated fatty acids double bonds oxidation in butter fats 206
Butter milk
hydrocolloid stabilisation/ heat treatment & shelf life extension of drinking cultured butter milk 153
Caffeine
tea, caffeine extraction/ spectrophotometric detn. in 200
Campylobacter
milk, Campylobacter thermal inactivation in 140
Cancer
palm oils, cancer progression & inhibitory effect of 211
Canning
tomato seeds, comp./ amino acid profile of canning waste

102
Cans
grapefruit juices, browning pigments HPLC separation/ comparison in stored 196
open top sanitary cans 13
Capsaicin
tastants & oral irritation by capsaicin 220
Carbohydrates
almond, carbohydrates comp. of developing 79
Carcasses
bull/ steer meat, carcass characteristics of 168
poultry carcasses, sampling method/ feed withdrawal period & microorganisms recovery from 176
poultry sp., comp./ carcass quality of 177
Carcinogenesis
coconut oils, chemical carcinogenesis inhibition by 210
Carotenoids
vegetables/ fruits/ berries, carotenoids in Finnish 18
Carps
muscle, proteins stability in subtropic carp 183
Carrots
particles in water, setting/ fluidisation characteristics of carrot 9
Casein
chemical characterization of bioactive peptides from casein 158
hydrolysates bitterness/ solubility & proteolysis of casein 159
infant formula, bovine casein enzymic dephosphorylation & clotting properties/ digestibility improvement for 187
structure/ foaming properties & surface properties of bovine casein 157
surface/ emulsifying properties of casein 156
Cauliflowers
blanching/ sulphite treatment & quality of frozen cauliflower 98
blanching/ sulphur dioxide & residual peroxidase activity in frozen cauliflower 99
Cereals
grains, pneumatic static pressure transducer for cereal 45
image analysis & characterization of cereal grains 40
Cheese
gamma irradiation & Listeria monocytogenes survival in Mozzarella cheese 150
Listeria monocytogenes & manufacture/ ripening of blue cheese 149
Cheesemaking
immobilized rennin for cheesemaking 148
Chemical composition
sweet potato slices, frying/ storage temp. & chemical comp./ quality of 94
vegetables, fiber content analysis in Canadian 97
Chemical properties
glutens, chemical properties of commercial 63
Chemicophysical properties
dietary fibers, physicochemical properties of 223
Chickens
salt content of kosher chicken 178
Chickpeas
volatile components of chickpeas 75
Chillies
214
Chilling
fruits/ vegetables, chilling injury of, review 112
pork, spray chilling & purge losses/ retail properties of 172
Chocolates
sensory properties evaluation of chocolates 122
Cholesterol
eggs, cholesterol content of 180
Chromatography
coffee, adulteration chromatographic detection in commercial soluble 191
food industries, chromatographic application in 20

Chromium
foods, Cr AAS detn. in 19
Cinnamon
214
Citrus
dehydrated citrus pips for dry beverage mixes 194
Clotting properties
infant formula, bovine casein enzymic dephosphorylation & acid clotting properties improvement for 187
Cocoa
roasting from nibs to liquor 121
seeds, fermentation & acid changes in cocoa 123
Cocount oil
chemical carcinogenesis inhibition by coconut oils 210
Coffee
adulteration chromatographic detection in commercial soluble coffee 191
aroma constitutents & mutagenicity of coffee 190
Coliforms
food/ water, pyruvate concn. & coliforms recovery from 34
most probable number/ hydrophobic grid membrane filter methods & coliforms recovery form foods 30
Composite flours
42
Andean pact countries, composite flour application of 41
Computers
food industries, computers in 14
Concentration
foods/ water, pyruvate concn. & coliforms recovery from 34
Consumers
sweet cherries, quality & consumer acceptance of stemless 119
Containers
cans, open top sanitary 13
Contamination
dairy processing plants, biological aerosols airborne contamination in 136
Salmonella detection in contaminated foods 38
Cookies
gliadin changes during cookiemaking 131
Cooking
beef steaks, cooking methods & physical/ sensory properties of restructured 167
rice, heating & cooking qualities of high moisture rough 55
Cooking quality
rice, milling & cooking quality of 51
Corn
germ protein, sensory properties/ proximate analysis/ amino acid comp. of frankfurters supplemented corn 67
pre-production development/ fabrication technique of tubular corn shellers 66
Corn bran
lipid metabolism in male albino rats, corn bran effect on 222
Corn meals
enzymatic hydrolysis of corn gluten meal 68
Corn proteins
germ proteins, sensory properties/ proximate analysis/ amino acid comp. of frankfurters supplemented 67
Corn starch
pastes, viscous behaviour of wheat/ corn starch 65
Cowpeas
processing method & nutrient content/ antinutritional factors in cowpeas 76
Cucurbits
seeds, enzymes/ enzyme inhibitors of cucurbit 100
Cultured milk
hydrocolloid stabilisation/ heat treatment & shelf life extension of cultured milk 153
Curcuma
volatile aroma compounds of curcuma 216
Curing
herring fillets, starter bacteria & curing of 184
Dairies
processing plants, biological aerosols airborne contamination in dairy 136

processing, electrical energy consumption in dairy 137
wastes, treatment of dairy 135
Dairy products
kishk as fermented dairy products 151
Deformation
oilseeds, pressing process & deformation characteristics of 202
Dehulling
tangential abrasive dehulling device & kernel hardness 43
Dehydrated foods
beverage mixes, dehydrated citrus pips for dry 194
Dephosphorylation
infant formula, bovine casein enzymic dephosphorylation & clotting properties/ digestibility improvement for 187
Detoxification
rapeseed meals, diafiltration & detoxification of alkaline extracted UK commercial 84
Diafiltration
rapeseed meals, diafiltration & detoxification of alkaline extracted UK commercial 84
Dietary brans
lipid metabolism in male albino rats, dietary bran effect on 222
Dietary fibers
foods, dietary fiber contents of traditional Japanese 228
foods, dietary fiber in our 224
physicochemical properties of dietary fibres 223
vegetables, fiber content analysis in Canadian 97
Digestibility
bread, in vitro protein digestibility of flat 128
infant formula, bovine casein enzymic dephosphorylation & digestibility improvement for 187
meat/ bone meals, N digestibility/ lysine availability in vitro detn. in 160
Diseases
tomatoes, sunscald & textural properties of 101
Disinfestation
nuts, irradiation disinfestation & biochemical quality of dry 78
Dried foods
wheat flour doughs/ bread, rheological properties of dry roasted air-classified pinto/ navy bean protein supplemented 130
Ducks
sp., comp./ carcass quality of duck 177
Dunaliella bradawil
safety evaluation of Danaliella bardawil 32
Eggs
aminoglycoside antibiotic residues in eggs 179
cholesterol content of eggs 180
plasmids & Bacillus cereus differentiation in eggs 181
Electrophoresis
glutens, electrophoresis & vitality of commercial 64
ELISA
foodstuffs, enzymes immunochemical assays in 24
meat products, pork detection ELISA technique in 171
Emulsifiers
casein, emulsifying properties of 156
Emulsions
breakdown of protein stabilized oil in water emulsions 207
Encapsulation
flavour encapsulation 10
Energy conservatrion
dairy processing, electrical energy consumption in 137
Engineering
food processing & engineering 11
Enzymes
corn gluten meal, enzymatic hydrolysis of 68
cucurbit seeds, enzmyes/ enzyme inhibitors of 100
foodstuffs, enzymes immunochemical assays in 24
infant formula, bovine casein enzymic dephosphorylation & clotting properties/ digestibility improvement for 187
pectins, enzymatic

quantification of 25
soy proteins, enzymatic phosphorylation of 87
Escherichia coli
food/ waste water, colony hybridization & DNA probe for enterotoxigenic E. coli detection in 35
milk, Escherichia coli thermal inactivation in fluid 140
Ethyl alcohol
milk, ethanol solutions & stability of 145
Ethylene oxides
vegetable products, ethylenechlorhydrine formation in ethylene oxide fumigated 92
Ethylenechlorhydrine
vegetable products, ethylenechlorhydrine formation in ethylene oxide fumigated 92
Export
horticultural produce, export prospects of Indian 8
Extraction
groundnut flour, solvent extraction & nutty flavour removal/ functional properties of 82
legume lipids, solvent extraction of 69
Extrusion
starch gelatinization, extrusion/ simulation & viscosity development during 125
Fast foods
7
Fats
beef steaks, fat level & physical/ sensory properties of restructured 167
fat industries, biotechnology in, review 201
metabolism disturbance, interesterified fat mixture & lipids in fat 204
Fatty acids
beef longissimus, tallow supplementation & fatty acid distribution in 165
butter fats, unsaturated fatty acids double bonds oxidation in 206
Fenugreek
214
Fermentation
barley, hydrogen & fermentation products of 48
cocoa seeds, fermentation & acid changes in 123
fruit musts, pectin demethylation during fermentation of 111
Fermented foods
Chinese fermented foods 26
dairy products, kishk as fermented 151
Firmness
kiwifruits, fruit firmness & sensory evaluation of 115
Fish
muscle, proteins stability in subtropic fish 183
Fish meals
fish meals, amino acid ion-exchange/ gas chromatographic analysis in 182
Fish oils
polychlorinated terpenes detn. in fish oils 186
Flatulence
legumes, flatulence-producing potential of Nigerian/ American 71
Flavonoids
wheat bran, flavonoids comparision in 58
Flavour
encapsulation of flavour 10
groundnut flour, solvent extraction & nutty flavour removal from 82
groundnuts, roasted flavour & maturity/ roasting of 81
soy-based spread, storage & flavour/ chemical characteristics changes of 86
Flavours
soybean oils, 3-methylonane-2,4-dione formation during flavour reversion in 212
Flours
composite flour in Andean pact countries, application of 41
mills, automation in flour 15
Fluidisation
carrot particles in water, fluidisation characteristics of 9
Fluorescence
glutens, fluorescence &

vitality of commercial 64
wheat, fluorescence & differentiation of 57
Foaming properties
casein, foaming properties & surface properties of bovine 157
Food industries
Brazil 4
computers use in food industries 14
Food safety
233
Food sciences
5
developing countries 6
developing countries 2
industrialised countries 3
Food services
industry, food service industry 1
Food technology
5
developing countries 2
food technology in developing countries 6
industrialised countries 3
Fractionation
glutens, fractionation & vitality of commercial 64
Frankfurters
corn germ protein, sensory properties/ proximate analysis/ amino acid comp. of frankfurters supplemented 67
potassium/ sodium bicarbonate & properties of processed frankfurters 174
Freezing
cauliflower, residual peroxidase activity & freezing of 99
milk, ice-nucleating bacteria abnormal freezing of 143
Fried foods
bacon/ meat products, 2-(hydroxymethyl) -N-nitrosothiazolidine occurrence/ detn. in cured/ fried 173
Frozen foods
cauliflower, blanching/ sulphite treatment & quality of frozen 98
cauliflower, blanching/ sulphur dioxide & residual peroxidase activity in 99
Fruit juices
gas production effect on fruit juices 108
ultrafiltration & manufacturing clear fruit juices 192
Fruits
carotenoids in Finnish fruits 18
chilling injury of fruits, review 112
Salmonella/ Shigella survival/ growth on sliced fresh fruits 109
waste materials, pectin de-esterification of alkali-treated fruit 110
Frying
sweet potato slices, frying & chemical comp./ quality of 94
Fumigation
vegetable products, ethylenechlorhydrine formation in ethyleneoxide fumigated 92
Functional properties
groundnut flour, solvent extraction & nutty flavour removal/ functional properties of 82
wheat flour, mixograph & functional properties of 59
Furctose
glucose, fructose spectrophotometric estimation in presence of 23
Garlic
pH/ heat treatment & volatile compounds formation/ stability in garlic 217
volatile compounds from garlic 218
Gas
fruit juices/ vegetable juices, gas production effect on 108
Gas chromatography
fish meal, amino acid gas chromatographic analysis in 182
grape monoterpenyl glycosides, GC of 114
soybean oils, isomers GC identification in hydrogenated 213.
Geese
sp., comp./ carcass quality of geese 177

Gelatinization
starch gelatinization, extrusion/ simulation & viscosity development during 125
Ginger
214
Glass
grapefruit juices, browning pigments HPLC separation/ comparison in stored 196
Gliadins
cookiemaking, gliadin changes during cookiemaking 131
sprouting resistance & gliadin proteins in wheat 62
Glucans
barley/ oat kernel development/ storage, glucan content/ solubility during 47
Glucose
fructose spectrophotometric estimation in presence of glucose 23
Glucosinolates
rapeseed var., glucosinolates in 85
Glutenins
free-flow preparative isoelectric focussing & structure of glutenins 46
Glutens
corn gluten meal, enzymatic hydrolysis of 68
physicochemical/ technological properties of commercial gluten 63
solubility/ fractionation/ electrophoresis/ fluorescence & vitaliity of commercial glutens 64
Glycosides
grape monoterpenyl glycosides, GC/ HPLC of 114
Grains
kernel hardness & tangential abrasive dehulling device 43
Grapefruit juices
bitter principles/ titratable acid adsorption from grapefruit juices 195
browning pigments HPLC separation/ comparison in stored grapefruit juices 196
Grapes
gamma irradiation & thiol compounds in grapes 113
monoterpenyl glycosides, GC/ HPLC of grape 114
Groundnut flour
solvent extraction & nutty flavour removal/ functional properties of groundnut flour 82
Groundnut oils
light induced oxidation of groundnut oils 208
Groundnut proteins
moisture & characterization of groundnut proteins during roasting 83
Groundnuts
comp., salt concn./ boiling effect on groundnut 80
irradiation disinfestation & bichemical quality of dry groundnuts 78
roasted flavour & maturity/ roasting of groundnuts 81
Hams
direct plating media & Listeria monocytogenes enumeration in hams 175
Hardness
grain kernel hardness & tangential abrasive dehulling device 43
wheat, hardness & differentiation of 57
Heat
garlic, pH/ heat treatment & volatile compounds formation/ stability in 217
milk, Campylobacter/ Yersinia enterocolitica/ Escherichia coli thermal inactivation in fluid 140
Heat transfer
rice, heat transfer during fluidized bed puffing of 53
Heating
153
milk powders, direct gas-fired heating & oxidative stability of whole 147
rice, heating & milling/ cooking qualities of high moisture rough 55
Hens
sp., comp./ carcass quality of hen 177
Herring
fillets, starter bacteria & curing of herring 184
Histamines

scombrotoxicosis & mackerel histamine content 185
Homogenization
milk, temp. & shelf life of pasteurized/ homogenized 139
Horticulture
export prospects of horticultural produces from India 8
HPLC
bread wheat, baking quality size-exclusion HPLC prediction in 56
food industries, HPLC application in 20
grape monoterpenyl glycosides, HPLC of 114
grapefruit juices, browning pigments HPLC separation/ comparison in stored 196
musts/ wines, fungicidal residues HPLC detn. in 188
phytic acid, macroporous polymer column & HPLC analysis of 44
Hydrogen
barley, hydrogen & fermentation products of 48
Hydrolysates
casein, hydrolysates bitterness/ solubility & proteolysis of 159
Hydrolysis
corn gluten meal, enzymatic hydrolysis of 68
Ice cream
gamma irridiation & Listeria monocytogenes survival in ice cream 150
Image analysis
cereal grains, image analysis & characterisation of 40
Immunoassays
meat, permethrin immunoassay detection in 162
Immunochemical method
food, immunochemical method for ovalbumin recognition in 225
Industries
biotechnology & food processing industry 39
computers use in food industries 14
food service industry 1
oil/ fat industries, biotechnology in, review 201
Infant foods
bovine casein enzymic dephosphorylation & clotting properties/ digestibility improvement for infant formula 187
Inhibition
palm oils, cancer progression & inhibitory effect of 211
Iron
Pseudomonas sp., iron & antagonism of 37
Irradiation
cheese/ ice cream, gamma irradiation & Listeria monocytogenes survival in Mozzarella 150
grapes, gamma irradiation & thiol compounds in 113
nuts, disinfestation/ biochemical quality of dry 78
Isoelectric focussing
glutenins, free-flow preparative isoelectric focussing & structure of 46
Jellies
124
Kishk
dairy products, kishk as fermented 151
Kiwifruits
fruit firmness & sensory evaluation of kiwifruits 115
Labelling
regulating misbranding of food 232
Lactobacillus acidophilus
nutrient media/ bile salt & growth/ antimicrobial activity of L. acidophilus 134
Laser trilobum
antimicrobial properties of Laser trilobum 219
Lectins
Acanthoscelides obtectus, seed lectin tolerance by 73
Legumes
comp./ flatulence-producing potential of Nigerian/ American legumes 71
lipids, solvent extraction of legume 69
Lentils
lipids, solvent extraction of lentil 69
Lipases
oat lipase, 4-methyl umbelliferyl heptanoate as

substrate for 50
Lipids
fat metabolism disturbance, interesterified fat mixture & lipids in 204
legume lipids, solvent extraction of 69
Listeria
foods, Listeria sp. in, survey 36
Listeria monocytogenes
cheese, Listeria monocytogenes & manufacture/ ripening of blue 149
hams/ oyster, direct plating media & Listeria monocytogenes enumeration in 175
Mozzarella cheese/ ice cream, gamma irradiation & Listeria monocytogenes survival in 150
nisin inhibitory action against L. monocytogenes 133
Lupins
storage proteins, proteolysis of lupin 72
Macadamia
rancidity detection by chemical analysis in stored macadamia 17
Maceration
tea, maceration method & chemical comp./ quality of clonal black 199
Mackerels
scombrotoxicosis & mackerel histamine content 185
Malting
modification of barley during malting 49
rice, malting of 52
Mangoes
anthracnose & physiological state of mangoes 118
nectar, ripening/ storage temp. & quality of mango 117
research in India, review 116
Margarine
butter-margarine blends, butter oil quantification in 205
Mash
sweet potato mash, processing method & products made from 95
Maturity
groundnuts, roasted flavour & maturity of 81
Meals
bone meals, N digestibility/ lysine availability in vitro detn. in 160
Meat
N digestibility/ lysine availability in vitro detn. in meat 160
permethrin immunoassay detection in meat 162
raw meat processing & recent studies of food exotrophia 161
roasting 163
Meat products
2-(hydroxymethy) -N-nitroseothiazolidine occurrence/ detn. in cured meat products 173
pork detection ELISA technique in meat products 171
processing temp. detection method for cooked meat products, review 164
Media
L. acidophilus, nutrient media & growth/ antimicrobial activity of 134
Metabolism
fat metabolism disturbance, interesterified fat mixture & lipids in 204
Microorganisms
beef, acridine orange direct-count technique microorganisms enumeration in 170
food, direct epifluorescent filter technique & television image analyser for microbes estimation in 28
Laser trilobum, antimicrobial properties of 219
poultry carcasses, sampling method/ feed withdrawal period & microogranisms recovery from 176
salad dressing, pH/ water activity & microbial stability of 29
sorghum syrup, plastic jars microbial destruction/ deformation by hot 70
Milk
aflatoxin detn. test method standardization for milk 138
astringent compounds isolation/ partial purification from ultra-high

temp. sterilised milk 142
bacterial quality of market milk 144
Campylobacter/ Yersinia enterocolitica/ Escherichia coli thermal inactivation in fluid milk 140
ethanolic solution & stability of milk 145
heat-induced salt balance changes in cow's milk 146
ice-nucleating bacteria abnormal freezing of milk 143
temp. & shelf life of pasteurized/ homogenized milk 139
Yersinia sp. isolation improved method from milk 141
Milk powder
direct gas-fired heating & oxidative stability of whole milk powder 147
Milk products
aflatoxin detn. test method standardization for milk products 138
Milkfish
muscle, proteins stability in subtropic milkfish 183
Milling
rice, heating & milling qualities of high moisture rough 55
rice, milling & cooking quality/ sensory quality of 51
rice, milling & mineral comp. of Indian 54
Mills
flour mills, automation in 15
Minerals
168
rice, milling & mineral comp. of Indian 54
sugarcane juices, smut infection & mineral nutrients of 126
tomatoes, minerals of 103
Moisture
groundnut proteins during roasting, moisture & characterization of 83
pigeon peas, moisture dependent physical properties of 77
rice, heating & cooking qualities of high moisture rough 55
Muscles
beef longissimus/ semimembranosus muscles, electrical stimulation/ blade tenderization & palatability, of 166
fish muscle, proteins stability in subtropic 183
Mushroom
carbon monoxide & catecholase activity inhibition in mushroom tyrosinase 33
Musts
fungicidal residues HPLC detn. in musts 188
pectin demethylation during fermentation of fruit musts 111
Mutagenicity
coffee, aroma constituents & mutagenicity of 190
Navy bean proteins
wheat flour doughs/ bread, rheological properties of dry roasted air-classified pinto/ navy bean protein supplemented 130
Nectars
mango nectar, ripening/ storage temp. & quality of 117
Nisin
L. monocytogenes, nisin inhibitory action against 133
Nitrogen
meat/ bone meals, N digestibility/ lysine availability in vitro detn. in 160
Nutmugs
214
Nutrition
Brazil 4
review 227
Nutritional values
cowpeas, processing method & nutrient content in 76
palm wines, nutritional value of 189
processed foods, nutritional values of 229
Sterculia foetida nuts, nutritive value of 88
Nuts
irradiation disinfestation & biochemical quality of dry nuts 78
rancidity detection by

chemical analysis in stored nuts 17
Sterculia foetida nuts, nutritive value of 88
Oats
kernel development/ storage, glucan content/ solubility during oat 47
lipases, 4-methyl umbelliferyl heptanoate as substrate for oat 50
Odour compounds
soybean oils, 3-methylonane-2,4-dione formation during flavour reversion in 212
Oils
emulsion, breakdown of protein stabilized oil in water 207
oil industries, biotechnology in, review 201
Oilseeds
pressing process & deformation characteristics of oilseeds 202
Orange juices
characterization of Spanish orange juices 197
packaging/ incandescent light & HTST-pasteurized orange drink 198
Oranges
peel & quality of tangerine oranges 120
Organic acids
tomatoes, organic acids of 103
Ovalbumin
immunochemical method for ovalbumin recognition in food 225
Oxidation
butter fats, unsaturated fatty acids double bonds oxidation in 206
groundnut oils, light induced oxidation of 208
milk powders, direct gas-fired heating & oxidative stability of whole 147
triacylglycerols, stigmasterol oxidation in heated 203
Oysters
direct plating media & Listeria monocytogenes enumeration in oysters 175
Packaging
orange drink, packaging/ incandescent light & HTST-pasteurized 198
trends, review 12
Packaging materials
vegetable products, packaging materials & ethylene chlorhydrine formation in ethylene oxide fumigated 92
Palatability
beef longissimus/ semimembranosus muscles, electrical stimulation/ blade tenderization & palatability of 166
Palm oils
cancer progression & inhibitory effect of palm oils 211
Palm wines
nutritional value of palm wines 189
Pasta
polysacchardes added baking flour & production of pasta 132
Pastes
wheat/ corn starch pastes, viscous behaviour of 65
Pasteurization
milk, temp. & shelf life of pasteurized/ homogenized 139
Pasting properties
wheat flour mixture, pasting properties of 60
Pecans
rancidity detection by chemical analysis in stored pecans 17
Pectic enzymes
apple juice, pectic enzymes & yield/ composition of 193
Pectins
enzymatic quantification of pectins 25
fruit musts, pectic demethylation during fermentation of 111
fruit waste materials, pectin de-esterification of alkali-treated 110
Peels
oranges, peel & quality of tangerine 120
Peppers
214
Peptides
casein, chemical characterization of bioactive peptides from 158
taste of peptides, review 226

tomatoes, peptides of 104
Permethrin
meat, permethrin immunoassay detection in 162
Peroxidases
cauliflowers, blanching/ sulphur dioxide & residual peroxidase activity in frozen 99
Pests
plants used for pest control in China, review 221
Phaseolus vulgaris
Acanthoscelides obtectus, seed lectin tolerance by 73
Phosphorylation
soy proteins, enzymatic phosphorylation of 87
Physical properties
beef steaks, fat level/ cooking methods & physical properites of restructured 167
glutens, physical properties of commerical 63
pigeon peas, moisture-dependent physical properties of 77
Physiology
mangoes, anthracnose & physiological state of 118
Phytates
sunflower seed proteins, phytate & soulbility of 90
Phytic acid
bread, phytic acid of flat 128
macroporous polymer column & HPLC analysis of phytic acid 44
Pigeon peas
moisture-dependent physical properties of pigeon peas 77
Pigments
grapefruit juices, browning pigments, HPLC separation/ comparison in stored 196
Pineapple guava
volatile compounds of pineapple guava 107
Pinenuts
irradiation disinfestation & bichemical quality of dry pinenuts 78
Pinto bean proteins
wheat flour doughs/ bread, rheological properties of dry roasted air-classified pinto/ navy bean protein supplemented 130
Plants
pest control in China, plants used for, review 221
Plastics
sorghum syrup, plastic jars microbial destruction/ deformation by hot 70
Polychlorinated biphenyls
foods, PCBs detn. in 230
Polysaccharides
pasta, polysaccharides added baking flour & production of 132
Pork
meat products, pork detection ELISA technique in 171
spray chilling/ vacuum packaged storage & purge losses/ retail properties of pork 172
Potassium bicarbonate
frankfurters, potassium bicarbonate & properties of processed 174
Potato chips
cvs. suitability evaluation for potato chip making 93
Poultry
carcasses, sampling method/ feed withdrawal period & microorganisms recovery from poultry 176
sp., comp./ carcass quality of poultry 177
Poultry products
processing temp. detection method for cooked poultry products, review 164
Pressing
oilseeds, pressing process & deformation charactersitiscs of 202
Processing
cowpeas, processing method & nutrient content/ antinutritional factors in 76
dairy processing, electrical energy consumption in 137
food processing & engineering 11
meat/ poultry products, processing temp. detection method for cooked, review 164
raw meat processing & recent studies of food exotrophia 161

Proteins
bread, in vitro protein digestibility of flat 128
emulsions, breakdown of protein stabilized oil in water 207
Proteins fish
muscle proteins stability in subtropic fish 183
Proteins milk
milk/ yoghurt, protein quality of acidophilus 154
Proteolysis
casein, hydrolysates bitterness/ solubility & proteolysis of 159
lupin storage proteins, proteolysis of 72
Pseudomonas
sp. iron & antagonism of Pseudomonas 37
Puffing
rice, heat transfer during fludized bed puffing of 53
Pyruvates
foods/ water, pyruvate concn. & coliforms recovery from 34
Quality
milk, bacterial quality of market 144
tea, maceration method & quality of clonal black 199
Rancidity
nuts, rancidity detection by chemical analysis in stored 17
Rapeseed meals
diafiltration & detoxification of alkaline extracted UK commercial rapeseed meals 84
Rapeseeds
var., glucosinolates in rapeseed 85
Regulations
misbranding of foods 232
Rennin
cheesemaking, immobilized rennin for 148
preparation/ enzymic properties of immobilized rennin 148
Residues
eggs, aminoglycoside antibiotic residues in 179
musts/ wines, fungicidal residues HPLC detn. in 188
Rheological properties
wheat flour doughs/ bread, rheological properties of dry roasted air-classified pinto/ navy bean protein supplemented 130
Rice
heat transfer during fluidized bed puffing of rice 53
heating & milling/ cooking qualities of high moisture rough rice 55
malting of rice 52
milling & cooking quality/ sensory quality of rice 51
milling & mineral comp. of Indian rice 54
Ripening
cheese, Listeria monocytogenes & ripening of blue 149
mango nectar, ripening & quality of 117
Roasting
cocoa roasting from nibs to liquor 121
groundnut proteins during roasting, moisture & characterisation of 83
groundnuts, roasted flavour & roasting of 81
Safety
Dunallella bardawil, safety evaluation of 32
food toxicology & safety evaluation 231
Sage
214
Salad dressing
pH/ water activity & microbial stability of salad dressing 29
Salads
washing procedures for production of prepared salads 27
Salmonella
foods, Salmonella detection in contaminated 38
fruits, Salmonella survival/ growth on sliced fresh 109
Salt
chicken, salt content of kosher 178
groundnut comp. & effect of salt concn. on 80
groundnut comp., salt concn. effect on 80
milk, heat-induced salt balance changes in cow's 146
Scombrotoxicosis

mackerel histamine content & scombrotoxicosis 185
Sensory evaluation
kiwifruits, fruit firmness & sensory evaluation of 115
Sensory properties
168
beef steaks, fat level/ cooking methods & sensory properties of restructured 167
chocolates, sensory properties evaluation of 122
corn germ protein, sensory properties of frankfurters supplemented 67
rice, milling & sensory quality of 51
Shelf life
milk, temp. & shelf life of pasteurized/ homogenized 139
yoghurt/ cultured buttermilk, hydrocolloid stabilisation/ heat treatment & shelf life extension of drinking 153
Shellers
corn shellers, pre-production development/ fabrication technique of tubular 66
Shigella
fruits, Shigella survival/ growth on sliced fresh 109
Sodium bicarbonate
frankfurters, sodium bicarbonate & properties of processed 174
Solubility
glutens, solubility & vitaility of commercial 64
Sorghum
syrup, plastic jars microbial destruction/ deformation by hot sorghum 70
Soy products
spread, storage & flavour/ chemical characteristics changes in soy-based 86
Soy proteins
enzymatic phosphorylation of soy proteins 87
Soybean
spread, storage & flavour/ chemical characteristics changes of soy-based 86
Soybean oils
3-methylonane- 2,4-dione formation during flavour reversion in soybean oils 212
isomers GC/ sliver nitrate thin-layer chromatographic/ NMR spectroscopic identification in hydrogenated soybean oils 213
Spectrophotometry
glucose, fructose spectrophotometric estimation in presence of 23
tea, caffeine extraction/ spectrophotometric detn. in 200
wheat protein, spectrophotometric detn. of 61
Spectroscopy
soybean oils, isomers NMR spectroscopic identification of 213
Spices
hepatic mixed function oxygenase system in rats & influence of spices 215
Spirulina maxima
toxicity of Spirulina maxima in male mice 31
Spray drying
milk powder, direct gas-fired heating & oxidative stability of whole 147
Sprouting
wheat, sprouting resistance & gliadin in 62
Stability
fish muscle, proteins stability in subtropic 183
milk powders, direct gas-fired heating & oxidative stability of whole 147
milk, ethanolic solution & stability of 145
Staling
bread, staling detn. in Egyptian-type 129
Starch
gelatinization, extrusion/ simulations & viscosity development during starch 125
Sterculia foetida
nuts, nutritive value of Sterculia foetida 88
Stigmasterol
triacylglycerols, stigmasterol oxidation in heated 203
Storage
barley/ oat kernel development/ storage, glucan content/ solubility during

47
lupin storage proteins, proteolysis of 72
mango nectar, storage temp. & quality of 117
nuts, rancidity detection by chemical analysis in stored 17
pork, vacuum packaged storage & purge losses/ retail properties of 172
soy based spread, storage & flavour/ chemical characteristics changes of 86
sweet potato slices, storage temp. & chemical comp./ quality of 94
tomatoes, storage temp & quality of fresh-market 105
Sugarcane juices
smut infection & yield/ juice quality/ mineral nutrients of sugarcane juices 126
Sugars
tomatoes, sugars of of 103
Sulphites
cauliflower, sulphite treatment & quality of frozen 98
Sulphur dioxide
cauliflower, sulphur dioxide & residual peroxidase activity in frozen cauliflower 99
Sunflower meal
production of special quality sunflower meal 89
Sunflower proteins
characterization of sunflower storage proteins 91
phytate & soulbility of sunflower seed proteins 90
Superoxide dismutases
foods, superoxide dismutase in, review 16
Sweet cherries
quality/ consumer acceptance of stemless sweet cherries 119
Sweet potatoes
mash, processing method & products made from sweet potatoes 95
slices, frying/ storage temp. & chemical comp./ quality of sweet potato 94
Tallow
beef longissimus, tallow supplementation & fatty acid distribution in 165
Tastants
capsaicin, tastants & oral irritation by 220
Tastes
peptides/ free amino acids, taste of, review 226
Tea
caffeine extraction/ spectrophotometric detn. in tea 200
macreation method & chemical comp./ quality of clonal black tea 199
Technological properties
glutens, technological properties of commercial 63
Technology
vegetables, post-harvest technology of Indian, review 96
Tenderization
beef longissimus/ semimembranosus muscles, electrical stimulation/ blade tenderization & palatability of 166
Terpenes
fish oils, polychlorinated terpenes detn. in 186
Texture
tomatoes, sunscald & textural properties of 101
Theropeautic values
yoghurts, therapeutic value of 155
Thin layer chromatography
soybean oils, isomers TLC identification in hydrogenated 213
Thiols
grapes, gamma irradiation & thiol compounds in 113
Tilapia
muscle, proteins stability in subtropic tilapia 183
Titratable acid
grapefruit juices, titratable acid from 195
Tomato proteins
proteins of tomatoes 104
Tomato pulps
comp. evaluation of tomato pulp 106
Tomatoes
chemical analysis of tomatoes 103

chemical analysis of tomatoes 104
seeds, comp./ amino acid profile of canning waste tomato 102
storage temp. & quality of fresh-market tomatoes 105
sunscald & textural properties of tomatoes 101
Toxicity
Spirulina maxima toxicity in male mice 31
Toxicology
food toxicology & safety evaluation 231
Triacylglycerols
stigmasterol oxidation in heated triacylglycerols 203
Turkeys
sp., comp./ carcass quality of turkey 177
Ultrafiltration
fruit juices, ultrafiltration & manufacturing clear 192
Vegetable juices
gas production effect on vegetable juices 108
Vegetable oils
organic compounds recovery from aqueous solutions & use of vegetable oils 209
Vegetable products
ethylenechlorhydrine formation in ethyleneoxide fumigated vegetable products 92
Vegetables
carotenoids in Finnish vegetables 18
chilling injury of vegetables, review 112
fiber content/ chemical comp. analysis in Canadian vegetables 97
post-harvest technology of Indian vegetables, review 96
Viscosity
starch gelatinization, extrusion/ simulation & viscosity development during 125
starch pastes, viscous behaviour of wheat/ corn 65
Volatile components
chickpeas, volatile components of 75
Volatile compounds
curcuma, volatile aroma compounds of 216
garlic, pH/ heat treatment & volatile compounds formation/ stability in 217
garlic, volatile compounds from 218
pineapple guava, volatile compounds of 107
Walnuts
irradiation disinfestation & bichemical quality of dry walnuts 78
Washing
salads, washing procedures for production of prepared 27
Waste water
broad bean proteins, waste water recirculation & quality of 74
Wastes
fruit wastes materials, pectin de-esterification of alkali-treated 110
tomato seeds, comp./ amino acid profile of canning waste 102
treatment of dairy wastes 135
Water
emulsion, breakdown of protein stabilized oil in water 207
foods/ water, pyruvate concn. & coliforms recovery from 34
Wheat
baking quality HPLC prediction in bread wheat 56
fluorescence/ hardness/ proteins & differentiation of wheat 57
Wheat bran
flavonoids comparison in wheat bran 58
lipid metabolism in male albino rats, wheat bran effect on 222
Wheat flour
doughs/ bread, sensory properties of dry roasted air-classified pinto/ navy bean protein supplemented wheat flour 130
mixograph & functional properties of wheat flour 59
mixture, baking quality/ pastry/ protein properties of wheat flour 60
pasta, polysaccharides added baking flour & production of 132
Wheat proteins

spectrophotometric detn. of wheat proteins 61
wheat flour mixture, protein properties of 60
wheat, proteins & differentiation of 57
Wheat starch
pastes, viscous behaviour of wheat/ corn starch 65
Whey
surface tension of whey/ whey derivatives 152
Wines
fungicidal residues HPLC detn. in wines 188
nutritional value of palm wines 189
Yersinia
foods/ milk, Yersinia isolation improved method from 141
Yersinia enterocolitica
milk, Yersinia enterocolitica thermal inactivation in 140
Yoghurts
hydrocolloid stabilisation/ heat treatment & shelf-life extension of drinking yoghurt 153
protein quality of yoghurts 154
therapeutic value of yoghurts 155

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